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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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The Institute and Medical Patents

WE publish in this issue the text of that part of the recent report on patent law reform by a Joint Chemical Committee that deals particularly with medical patents. It is desirable that this should be carefully studied, if the points in dispute between certain members of the medical profession and chemists engaged in therapeutic research are to be intelligently followed. Meanwhile, it is of interest to notice a significant modification of the original attitude of the Institute of Chemistry on this question. After considering certain representations received from members the Council of the Institute has addressed a communication to the Board of Trade Patents Committee stating that, although the report of the Joint Chemical Committee received the general approval of the Council in November, 1929, the Council had not before it, at that time, the views of research chemists engaged in work connected with medical patents. Having given careful consideration to the proposed scheme of dedicated patents, the Council has formed the opinion that medical patents should not be treated differently from other patents. The Council has expressed the view that the individual research worker should not be deprived of any reward for the results of his inventions, and that manufacturers could not afford to retain the services of research chemists if they were to be deprived of any advantage to be gained from their work. Research chemists will, of course, welcome this weighty decision against the preferential treatment of medical patents and in favour of the view that the individual research worker must not be deprived of any reward to which his work may entitle him.

To the Institute's attitude may now be added that of the Chartered Institute of Patent Agents. According to a statement by the secretary (Mr. H. Thompson), the Council are fully alive to the motives which have always influenced the medical profession in giving freely to the public the many discoveries which have been the result of their devoted labours. Apart, however, from the technical difficulties of determining the dividing line between medical and other inventions, the Council are of opinion that any compulsory dedication of the fruits of prolonged research endowed or conducted by commercial concerns will either prevent such work from being undertaken or lead to the secrecy which all Patents Acts are designed to frustrate. The Council recognise that if the Patents Acts enabled the patentee, whatever his profession or invention, to dictate his own terms to the public, the Acts would call for amendment, but in their present form the Patents Acts contain express provisions which enable the Comptroller or the Court to check any abuse by a patentee of his monopoly rights. These may have been overlooked. The final judgment of the Council is that the best way to prevent any abuse, if it should arise, is by the use of the existing machinery rather than by any alteration of the present law.

"H. E."

THE presentation to Professor Henry E. Armstrong of the Albert Medal of the Royal Society of Arts "for his discoveries in chemistry and his services to education," is an honour that will give pleasure and satisfaction not only to himself but to his many friends and admirers everywhere. That the Medal should be presented by the Duke of Connaught adds a fitting personal touch to so public a distinction, for Professor Armstrong ranks himself among the ardent admirers of the late Prince Consort and remains impressed by his work in connection with the 1851 Exhibition, the Royal College of Chemistry, and other institutions associated with art, science and general education.

In acknowledging the presentation Professor Armstrong gave us a sufficient taste of the quality of his personal reminiscences to make us wish that he would draw more exhaustively on this immense store and put on permanent record what he has seen, in a long, distinguished, and interesting career, of the life and manners of his times and of the great scientists whom, from Huxley down, he has numbered among his friends

and acquaintances. As he recalled, it is just over 50 years since, with Professor Ayrton, he became Professor of Chemistry at "Finsbury." His students, many of them to-day holding distinguished positions, have amply testified to his inspiration as a teacher. But Professor Armstrong is even more than a great teacher; he is a great character—"and a deuced bad one," we have heard him add, with his merry chuckle. His life has been long in years, rich in interests, wide in influence. Nothing could be better than that he should grow into what, by common assent, he has become—the "G.O.M." of English chemistry, a picturesque and incomparable figure in this age of practical pedestrian efficiency.

Nitrate Price Arrangements

No authentic reports of the results of the Paris and Ostend nitrogen conferences have so far been issued, but two announcements issued on behalf of Chilean interests and of synthetic producers are significant. Dr. S. Williamson, the Chilean delegate for Great Britain and Ireland, in an official notice issued to approved dealers by the Chilean Nitrate Committee, states that "the selling prices and conditions of sale for Chilean nitrate of soda in Great Britain and Ireland for July 1–31, 1930, are the same as those ruling for June." This is closely followed by an announcement by Imperial Chemical Industries in similar terms that the selling prices and conditions of sale for sulphate of ammonia during July will be the same as those for the period February to June. This would clearly point to some mutual understanding between the Chilean producers and the synthetic interests to avoid for the present any price cutting competition.

Looking to the future of the industry, it is reasonable to expect Chilean, German, and British interests to come to some arrangement for avoiding a disastrous measure of over production and a corresponding inevitable drop in prices. Outside these organisations, however, there are a number of synthetic producers in several countries, while in this country so large a by-product organisation as the South Metropolitan Gas Co. remains outside the combine. Whatever may be the explanation, recent inquiries from Australia clearly suggest that sulphate of ammonia is being offered abroad at prices below the official prices published by the selling organisation of the synthetic and the organised by-product producers in this country. The steady increase in production is bound to have an effect on market prices, and if the industry is not to suffer heavily some restriction of future output seems essential. This, it is reported, has in several cases already been decided on, but whether those and similar methods will avert a war between the natural and the synthetic product is a matter for the future.

The Chilean interests have demonstrated by their recent reorganisation scheme their determination not to be beaten in the market that was once their own. Unless, however, the rate of increase in consumption quickens appreciably, it will be difficult to avoid a price conflict between them and the huge interests that chemical science and technology have created. Much is being written on this subject at present, but the speculation comes down to very little when examined, and many will be content with just the common-sense view of the situation.

The Importance of the Personal Touch

In these days of rationalisation a good deal is heard about the efficiency of large-scale concerns. But there is also a tendency for the independent trader to apologise for his smaller unit, as if he were a last remnant of an old order that is passing away. How very different is the actual state of affairs, and how important is the position of the "independent," is brought home in a report on British trade just issued by the United States Department of Commerce. During the latter half of 1929 an inquiry was made by this American authority into the development of the multiple shop movement in Great Britain, and the results show that less than 8 per cent. of the shops in this country are in this special class. As against 32,025 multiple shops and branches, there are 423,595 "independents." These are sweeping figures, and if they are approximately accurate they demonstrate in a really striking manner the continued strength of the individual trader.

From the manufacturers' standpoint, the multiple shops have the disadvantage that they are beginning to manufacture on their own account, as with the co-operative societies. In such cases the merchant and broker also suffer loss of business. But if the figures for the retail side of the picture are representative of the whole of industry—as we believe they are—there is, indeed, cause for satisfaction among the overwhelming majority of those engaged in trade. More than ever there is scope for the personal touch, which will always remain the secret of business success. Competition for the smaller unit is undoubtedly keener, but the independent trader who caters efficiently for the "quality" market will prevail. The American report refers to the importance of the friendly service which comes of the trader satisfying the individual tastes of his customers, whom he knows and who know him through personal contact. Once again an examination of new methods in business brings out the truth that buying and selling is something more than the mere exchange of goods, and has about it those human elements which can only be fully satisfied by the personal touch.

Books Received

Report On the Work of the Mining Research Laboratory of the University of Birmingham During the Year 1929. Birmingham: The University. Pp. 18.

Science in the Kitchen.—A Series of Eight Radio Talks. University of Pittsburgh. Pp. 82. 60 cents.

The Calendar

July 10	Association of British Chemical Manufacturers: Annual Dinner. 7.15 p.m.	Grosvenor House Hotel, Park Lane, London.
14–19	Society of Chemical Industry: Annual Meeting. Presidental Address—Dr. Levinstein: "Only an Apprentice in Nature's Workshop."	Birmingham
Sep. 3–10	British Association for the Advancement of Science	Bristol.
Sep. 29 to Oct. 1	Faraday Society: General Discussion: "Colloid Science Applied to Biology."	The Laboratory of Physical Chemistry, Free School Lane, Cambridge.

Chemistry in the New "Encyclopædia Britannica"

A Group of Notable Articles

THE rapid advances in all branches of science which have taken place since the publication (1910–11) of the eleventh and last complete edition of the *Encyclopædia Britannica*, imposed a difficult task of selection on scientific contributors to the new fourteenth edition.

In no department of physical science has this unavoidable compression been more difficult than in the section of Chemistry, to which the space now allotted is approximately five-sixths of that in the earlier edition. The departmental editor for Chemistry was Professor G. T. Morgan, Director of Chemical Research in the Department of Scientific and Industrial Research, who collaborated with Dr. A. D. Mitchell, assistant editor to the *Journal* of the Chemical Society. These joint editors were fortunate in securing the co-operation of many eminent contributors who wrote on chemical topics of which they had first-hand expert knowledge.

Fifty-five pages are occupied with the main article "Chemistry," the remaining space being mainly allocated to more specialised contributions by competent authorities on chemical subjects of outstanding interest. The leading article opens with a scholarly treatise on the history of chemistry by Professor H. B. Dixon, whose survey includes the growth of the science from its early origins in ancient Egypt and Greece to the birth of modern chemistry in the time of Boyle and its progressive evolution under Black, Cavendish, Scheele, Priestley and Lavoisier. More modern developments associated with such names as Mendeléef, Crookes, van t'Hoff, Ramsay, Rutherford, Moseley, Bohr and Aston are duly summarised. This introduction is followed by sections dealing in greater detail with the main divisions of modern chemical science.

Inorganic chemistry, somewhat truncated by the removal of the Periodic Law to a separate article, deals briefly with the discovery of chemical elements and with the classification and terminology of chemical compounds. To the wide field of organic chemistry is accorded a special historical introduction and subdivision into three sections of aliphatic, homocyclic, and heterocyclic compounds. A separate section is devoted to physical chemistry, and the main article concludes with a review of analytical chemistry under three headings of inorganic, ultimate organic and gas analysis. By this arrangement the article "Chemistry" appears as a joint contribution by ten experts in their respective sections.

A valuable feature of the new *Encyclopædia* as a work of reference is seen in the fact that each chemical element, no matter how rare, is given a separate heading, and a concise descriptive article of a length depending on the use which has been made in the arts and manufactures either of the element itself or of its compounds. The article on "Argon," a notable example of such references, was written originally by the late Lord Rayleigh and has now been revised by his son, the present Lord Rayleigh. The article "Rare Earths" is contributed by Professor C. James, of New Hampshire University, who also furnishes separate references to all the metals of this group of oxides. The rare metal "Germanium," the existence of which was predicted by Mendeléef, was discovered subsequently by Winkler and named after its country of origin. Reference is made to its recent intensive study by Professor L. M. Dennis and his collaborators in Cornell University. The chemistry of Gold, Silver and the metals of the platinum group is summarised in separate very readable chapters by the late Dr. F. E. Matthews, formerly associated with Johnson and Matthey, research and metallurgical chemists.

A fundamental problem of chemistry is the determination of the Atomic Weights of the elements. This subject is discussed authoritatively by the late Professor T. W. Richards, formerly of Harvard University, who was himself a master of the intricate technique involved in such determinations.

The omission of a special heading for "Ions" is noteworthy, because an arresting article on this topic might have been written from the chemical viewpoint. This lacuna is, however, partially filled by a note from Professor H. M. Dawson on "The Catalytic Action of Ions."

Among the important contributions on the border line between chemistry and chemical industry is an article on "Chemical Engineering," by Professor J. W. Hinchley, and chapters on "Explosives," "Incendiary Mixtures," "Lead Azide" and "Picric Acid," by Professor W. R. Hodgkinson. The article on "Synthetic Dyes," by Professor A. G. Green, is a valuable contribution to pure and applied chemistry, and scattered throughout the volumes are useful notes by Professor A. G. Perkin on natural dyes, each under its appropriate heading ("Fustic," "Natural Indigo," "Lac Dye," "Persian Berries," etc.).

Dr. T. A. Henry, Director of the Wellcome Research Laboratories, writes in a pleasing style on "Alkaloids," "Natural Glucosides" and "Cinchona Bark." The chemistry of the sugar group is discussed in Professor W. N. Haworth's comprehensive treatise on "Carbohydrates." Professor R. Robinson presents the chemistry of "Chlorophyll" and "Anthocyanins and Anthoxanthins."

The editor and his assistant furnish articles on subjects with which they are personally familiar. The former's chief contributions are on antimony, arsenic, diazo-compounds, organo-metallic compounds, selenium and tellurium. The latter writes on ammonia, allotropy, association, calcium, carbon compounds, phosphorus, and chemical apparatus. The last of these articles is illustrated by diagrams and plates of typical laboratory implements and apparatus.

The staff of the Chemical Research Laboratory, Teddington, have supplied numerous articles on the subjects of their investigations, of which the following are examples: Coal tar, low temperature tar, corrosion and rusting, distillation, helium, naphthalene, pressure chemistry, pyridine, quinoline and resins. The articles on "Beryllium" and "Metals" are written by metallurgists of the National Physical Laboratory. Members of the Government Laboratory have furnished authoritative chapters on "Alcohol" and "Salt."

The physical chemistry section includes several informative contributions by distinguished authorities. Professor E. K. Rideal writes on "Catalysis," a subject of perennial interest, that now plays an increasingly important part in chemical industry. In the article "Photochemistry," Dr. S. E. Sheppard deals in a clear and lucid manner with the chemical action of radiant energy on matter and with the direct production of radiation by chemical reactions. "Thermochemistry," from the pen of the Rector of the Imperial College, is a logical presentation of that branch of chemistry which considers the heat changes taking place during chemical reactions. Dr. J. A. V. Butler, of the University of Edinburgh, presents the subject of "Solutions" in a popular manner but w thout loss of scientific accuracy.

Included in the Chemistry Section are several contributions of general interest. Professor A. Smithells' illustrated article on "Flame" describes in simple terms a phenomenon which was formerly invested with a peculiar element of mystery. Professor Lowry expounds the chemical conception of "Isomerism" and cites many typical examples of this phenomenon. The influence of

chemical constitution on the colour of organic compounds is admirably discussed in a concise note by Professor J. F. Thorpe, President of the Chemical Society.

In "Stereochemistry," Dr. W. H. Mills contributes a fascinating article on the arrangement in space of the atoms of chemical molecules, and traces the growth of knowledge from Pasteur's study of the tartaric acids to the present time. At first restricted in its application to carbon compounds, stereochemical inquiry has now been extended successfully to compounds of other elements through the researches of Pope, Meisenheimer, A. Werner, and the contributor of this article.

The philosophy of chemical combination and atomic structure is summarised and explained by Dr. N. V. Sidgwick in his illuminating article on "Valency," wherein he deals in turn with the theories which have been propounded at various times to account for the diverse manifestations of chemical affinity.

Many of the chemical contributions are entirely new, and have been specially written for the present edition. The old articles have been revised and modernised, with the result that in most instances they have been rewritten completely. The information thus presented is precise and up to date and moreover, since the majority of the chemical articles contain bibliographies and references to the more accessible monographs and treatises, they serve as convenient starting points for the more detailed study of chemical topics. For these reasons the new *Encyclopædia* is a work which may well be included in the reference library of any scientific institution.

Professor Armstrong Honoured

Albert Medal Presented by Duke of Connaught

THE council of the Royal Society of Arts attended at Clarence House, London, on Thursday, June 26, when the Duke of Connaught, president of the society, presented the Albert Medal for 1930 to Professor Henry E. Armstrong, F.R.S., "for his discoveries in chemistry and his services to education."

Lieutenant-Colonel Sir Malcolm Murray was in attendance upon the Duke of Connaught, and the members of the Council present were: Dr. Edward F. Armstrong, Lord Askwith, Captain Sir Arthur Clarke, Mr. Peter M. Evans, Sir Edward Gait, Sir Robert Hadfield, Rear-Admiral James de C. Hamilton, Major Sir Humphrey Leggett, Sir Philip Magnus, Mr. J. A. Milne, and Sir Richard Redmayne, with Mr. G. K. Menzies (secretary of the society).

Professor Armstrong said that he felt especial gratification in receiving the medal from the son of the great man in whose memory the foundation was established. "I have long revered his name," he declared. "Although not born under the shadow of the 1851 Exhibition, which his Royal Highness your father and the Society of Arts, of which he was chairman at the time, did so much to promote—we are both its seniors—I have lived under its shadow all my life since it was re-erected as the Crystal Palace, at Sydenham—a marvellously stable structure of iron and glass, I spent many happy hours there and learnt much there in my youth." Professor Armstrong said Prince Albert early became one of his heroes.

His first experience as a chemist, Professor Armstrong continued, was gained under the great Hofmann, in the Royal College of Chemistry, Oxford Street, translated in 1870 to South Kensington. The college was established in 1845 largely owing to Prince Albert's efforts; in particular, he was instrumental in securing Hofmann as its first professor. The college came into being on the top of a wave of enthusiasm raised by Liebig in a triumphal tour throughout England, in which he was personally conducted by Lyon Playfair. Liebig's theme was the application of scientific method to agriculture—they were still far from having carried out his behests. Hofmann, he might mention, was the scientific father of Perkin, the discoverer of the first aniline dyestuff; also of the late Sir William Crookes, the founder of modern electrophysics.

The world had yet to appreciate the greatness of the work done by Prince Albert in establishing the Commission for the 1851 Exhibition, since continued on a broader basis, as the guardian of the research scholarship scheme originated by the late Lord Playfair. He was also concerned in the erection of the great Art Museum at South Kensington, and in the establishment of the Science and Art Department, long the leading agency of instruction in elementary science and art throughout the country. His work was to-day reflected in all the scientific institutions at South Kensington.

A Pioneer of Chemical Teaching

Professor Armstrong went on to say that 50 years ago last year, at about that time, he received a letter from the then secretary of the society, the late Sir Trueman Wood, telling him that the late Professor Ayrton and himself had been appointed by the City and Guilds Institute for Technical Education as their first professors. They established the Finsbury Technical College upon original lines, and were the first workers in the great technical education movement which was soon to extend over London and England generally. Their work was entirely of a kind that Prince Albert would have appreciated. He (Professor Armstrong) was the first member of the body of teachers who took part in that work to receive public recognition, and it was not merely on his own behalf that he tendered his thanks that day. The Royal Society of Arts was so broad in its constitution, so catholic and sympathetic in its operations, that the seal of its approval must rank very high. Among the recipients of the medal were not a few chemists, beginning with Faraday and Liebig, and ending with Mme. Curie and Sabatier. To be placed with such as those was indeed a distinction.

Sale of Poisons from Automatic Machine

Held to be Illegal

SALES of poisons by means of automatic machines were held to be contrary to the Pharmacy Act, 1908, by Judge Crawford, on a reserved judgment delivered in the Edmonton County Court, on Thursday, June 26. The Council of the Pharmaceutical Society, sought a ruling on the question, and brought an action against H. R. Watkinson, a London chemist, to recover a penalty of £5. The action was a friendly test case, the defendant being a member of the Pharmaceutical Society. Evidence had been given at previous hearings that an inspector employed by the plaintiffs visited the defendant's premises after the shop was closed, and purchased bottles of Lysol from an automatic machine. It was submitted that such sales were illegal, as the defendant or a qualified man was not present at the sale, which was necessary under the Act, Lysol being included in the schedule of poisons.

His Honour, in the course of a lengthy judgment, said he would have to hold that the machine was part of the defendant's premises, and that he was carrying on a business therefrom. Under the Pharmacy Act, the defendant had to supervise the sales of poisons from his shop, but he could not hold that there had been any supervision in the case in question. He considered that the Act meant that there had to be active participation in the business by the defendant, which was impossible under the circumstances, as the shop was closed, and the machine was outside the premises. He considered, from the public point of view, that poisons should not be sold by this means, although his decision was not based on the question of public policy. He would have to enter judgment for the plaintiffs for the amount claimed, and costs.

"Photography Simplified"

THE second of a series of booklets published by Burroughs Wellcome and Co., under the title of "Photography Simplified," has just been issued. This edition deals with the question of development by the most scientific and safe method—the time and temperature method—as well as the relationship between exposure and development. The after-treatment of negatives by intensification or reduction is also described, the illustrations showing the difference between correct development, over- and under-development, and the improvement in faulty negatives which can be effected by using reducers or intensifiers. Notes are included on developers in relation to particular classes of work. To any reader mentioning this journal the booklet will be sent post free by the publishers, Burroughs Wellcome and Co., Snow Hill Buildings, E.C.1.

Sir George Beilby Memorial

Two Awards of £250 Each

As a memorial to the late Sir George Beilby, the distinguished chemical engineer who died in 1924, a fund was collected in 1926, from the interest on which, at the discretion of the administrators, awards are to be made from time to time to British investigators in science, to mark appreciation of distinguished original work carried out over a number of years, preference being given to investigations relating to the special interest of Sir George Beilby, including problems connected with fuel economy, chemical engineering and metallurgy.

The administrators of the fund have announced the award of £250 each to Dr. Guy Dunstan Bengough, of the Chemical Research Laboratory, Teddington, and Mr. Ulick Richardson Evans, of Cambridge.

Mr. G. D. Bengough

Guy Dunstan Bengough was born in 1876 and educated at Malvern College and Cambridge University, where he took his B.A. degree in 1898, and M.A. in 1901. He studied for two years at the Royal School of Mines, South Kensington, and subsequently spent several months in the late Sir William Roberts-Austen's research laboratory at the Royal Mint. He started the Department of Metallurgy at the Sir John Cass Technical Institute where he stayed for two years, resigning his position to become metallurgist and assayer to a Burmese tin syndicate. On returning to this country he was appointed lecturer in metallurgy at Birmingham University, and in 1907 took charge of the Metallurgical Department at Liverpool University.

Mr. Bengough's first research work was done at Liverpool and consisted of metallographic investigations on the annealing of metals and on the tensile properties of alloys at high temperatures. In some of this work he was associated with O. F. Hudson and D. Hanson. In 1911 he published the first of a series of reports to the Corrosion Research Committee of the Institute of Metals. This series was largely concerned with the corrosion of condenser tubes and was continued till 1924, when the 7th Report was published in collaboration with R. May. In 1913 he took his D.Sc. degree at Liverpool University. In September, 1914, he was gazetted to the Royal Garrison Artillery (T.F.), and in 1915–16 was Captain and Adjutant to the C.R.A. Mersey defences. In the latter year he was seconded for research work at the request of the Admiralty. In 1924 he left the service of the Institute of Metals to take up an appointment under the Department of Scientific and Industrial Research, and in 1926 he published, in conjunction with J. M. Stuart, an account of the anodic process for the protection of aluminium and certain light alloys against corrosion. Patents for this process had already been granted to the two authors and the rights assigned to His Majesty's Treasury; the process has come into use all over the world, wherever aircraft are made, and has been found useful for such diverse purposes as the protection of artificial limbs, surveying instruments and metal rollers.

In 1927 Mr. Bengough was appointed principal assistant at the Department's Chemical Research Laboratory, Teddington, where he is now in charge of the corrosion research section of the laboratory, in which a great variety of corrosion problems are being investigated. In 1928 he was invited to give a special lecture on corrosion before the 8th Congress of Industrial Chemistry at Strasbourg, and to write the article on corrosion in the latest edition of the *Encyclopædia Britannica*. In conjunction with J. M. Stuart and A. R. Lee he has recently published a series of papers in the Proceedings of the Royal Society and elsewhere on the theory of corrosion in the light of quantitative measurements.

Mr. U. R. Evans

Ulick Richardson Evans was born March 31, 1889, at Wimbledon, and was educated at Marlborough College (1902–1907), and at Cambridge University (1907–1911), where he gained an "Exhibition" at King's College; he took his B.A. degree in 1910, and M.A. in 1914. During 1913 and 1914 he was associated with Dr. E. K. Rideal in electrochemical consulting work in London. From August, 1914, until 1919, he was in the Army, first with the infantry and later attached to the signal services of the British and Indian armies. Returning to Cambridge University in 1920, he devoted three years to writing a four-volume book on "Metals and Metallic Compounds." Since its publication, in 1923, he has been occupied mainly with research work on the corrosion and passivity of metals, and on the properties of the thin oxide films frequently present on the surface of metals. These films—which may profoundly influence the behaviour of the metals—are usually invisible, although, as Mr. Evans showed, they become visible when removed from the brightly reflecting basis. On these subjects he has published about 30 scientific papers, the majority of which have appeared in the Journals of the Institute of Metals, Faraday Society, Chemical Society and Society of Chemical Industry; communications have also been published in the Proceedings of the Royal Society, *Nature*, and several other journals.

Mr. Evans is also the author of several papers on other scientific and technical subjects, including "Recrystallization in metals," "Colloid-chemistry," "Fuel cells," and "Electrotanning." Much of this work has been conducted alone, but there have been joint papers with E. K. Rideal, L. L. Bircumshaw, M. Cook, R. T. M. Haines, L. C. Bannister, J. Stockdale, S. C. Britton, and others. In 1924 appeared the first edition of Mr. Evans's book on the "Corrosion of Metals"; the second edition, greatly altered owing to the advances made in the intervening two years, was published in 1926; this book has been translated into German (1926) and French (1928).

Considerable interest in Mr. Evans's work has been shown abroad, particularly in the United States. He contributed papers (in each case at the request of the organisers) to three "symposia" on corrosion held in America in the years 1924, 1925 and 1927; and in February, 1929, by invitation of the American Institute of Mining and Metallurgical Engineers, he visited New York to deliver the annual lecture on Metals; this was followed by a lecture tour in the States. Mr. Evans is a member of the Corrosion Committee of the Department of Scientific and Industrial Research, and of the Corrosion Committee of the Iron and Steel Institute; he was recently elected the "Honorary Corresponding Member" for Great Britain of the German "Reichsausschuss für Metallschutz."

The administrators of the fund are the Presidents, Treasurers and Secretaries of the Institute of Chemistry, the Society of Chemical Industry and the Institute of Metals.

French Sulphuric Acid Output

In 1929, France produced about 30,000 metric tons more of sulphuric acid than in 1928, or roughly 1,650,000 tons 53° Be. This expansion is attributed to larger requirements for ammonia products, chiefly sulphate. About 70 per cent. of the sulphuric acid is used for fertilizer production. Acid for this outlet is practically all produced from pyrites, which, with the exception of about 200,000 tons, local production, is imported. Imports of pyrites have increased over 400,000 tons since 1926, and exceeded 922,000 tons in 1929. In 1928 there were net exports of 10,000 tons, while in 1929 the foreign trade in this item practically balance imports and exports, each being roughly 20,000 tons.

The Controversy about Medical Patents

What the Chemical Committee Really Propose

In view of the controversy now proceeding on the subject of medical patents, we have been asked to publish the text of the Joint Chemical Committee's memorandum on the subject, on the ground that much of the criticism is based on an incomplete view of the position. The document is somewhat long, but it has been so carefully drafted that to summarise it and yet present all its points is impossible. In these circumstances the memorandum is reproduced below.

I.

SECTION 38A (1) of the Patents and Designs Acts, 1907 and 1919 (Consolidated), is as follows: "In the case of inventions relating to substances prepared or produced by chemical processes or intended for food or medicine, the specification shall not include claims for the substance itself, except when prepared or produced by the special methods or processes of manufacture described and claimed or by their obvious chemical equivalents; provided that, in an action for infringement of a patent where the invention relates to the production of a new substance, any substance of the same chemical composition and constitution shall in the absence of proof to the contrary be deemed to have been produced by the patented process." Under this section, therefore, it is possible to take out patents for medical remedies. The lattter may be divided roughly into two main classes:—

(*a*) Definite chemical compounds, with a specific effect in certain diseases. Such inventions usually arise from purely chemical investigations, and the medical research worker only intervenes at the stage of pharmacological and clinical trials.

(*b*) Biological productions, such as Vitamins, Insulin, Serums, Vaccines, etc. These products generally originate with the medical research worker, but the chemist (or biochemist) comes in, during the later stages when isolation and investigation of the active principles (*e.g.*, adrenaline, thyroxine) of such products is attempted.

These two classes may overlap, but it is clear that there are two groups of workers concerned—chemists and medical research workers.

II.

Chemists as a body appear to have no objection to taking out patents for substances used for medical treatment since eminent chemists, including university professors, are to be found among British patentees of such products. It is, however, quite otherwise with the medical profession, a large section of which is believed to be resolutely opposed at present to taking out such patents, whether they be of purely chemical or biological origin, and the following are the two main arguments advanced:—

In the first place the medical profession is peculiar in its special relation to human life and suffering, and when doctors prescribe a particular drug they are expected to be free from any suspicion of financial bias in its choice. A patent in relation to any medical remedy tends at first sight to give the impression of making profit out of human suffering.

The second and more important objection, the validity of which is however doubtful, is that the freer use of patents would result in greater secrecy on the part of research workers, whereas the fullest and freest interchange of knowledge and mutual assistance between workers in different laboratories is essential for progress.

Secrecy would undoubtedly have a very adverse effect on medical research because of the complexity of the problems, and the necessity for the full and rapid publication of all information bearing on them. There is, however, some doubt as to how the full and early publication can best be assured.

III.

The object of our patent law is to stimulate invention by offering a reward, and to extend industry in this country by the application of new discoveries. In other fields it succeeds in that object, even though in them, as in medicine, it often happens that the patented invention does not benefit the actual discoverer of the knowledge on which the invention depends. While this is a state of affairs very difficult to avoid or to remedy, it is important to seek for compensating influences thereto. The border line between discovery and invention is very difficult to define in medical fields. A medical discovery is often the culmination of years of progressive research by many workers, and it is manifestly unfair that the worker who is lucky enough to take up the work at a certain stage when most of the work has been done, and who merely puts the finishing touches to it, should be able to reap the sole monetary reward of the cumulative effort. Such a state of affairs usually discourages scientific workers who have contributed largely to the research on which the invention is based, when they find that the knowledge they have freely provided is being monopolised by the inventor of perhaps merely a small addition or modification. The fact remains, however, that the general motive of most scientific workers is the satisfaction of advancing knowledge and not monetary reward.

IV.

It may be useful to glance at the circumstances surrounding one or two important instances in which the question of patents has been involved in connection with inventions subserving medical treatment.

(*a*) *Insulin.*—In 1923 Dr. Banting made the final addition to a long series of discoveries by which the preparation of Insulin was rendered possible. This was protected by a patent taken out in the name of the University of Toronto, where Dr. Banting was working. The British patent rights were offered by the University to the Medical Research Council, whose action in accepting them caused much unfavourable comment in the medical profession and some opposition by important men of science. It is understood that the Medical Research Council did so on two grounds: (1) That the patent was better in their hands than in anybody else's. (2) That it enabled them to exercise the power which was necessary in order to secure the proper use of the knowledge and to control the manufacture of Insulin, there being at that time no Therapeutic Substances Act by which this could be effected. It is agreed that events have fully justified this action, as it has resulted in Insulin of the highest quality being now available at very low cost, owing to the fact that the few firms to whom the manufacture was entrusted were enabled thereby to devote considerable energy and capital to developing efficiency in manufacture and a high quality of product.

(*b*) *Thyroxine.*—At the time that Dr. Harington published all but the final stage of the synthesis of thyroxine, he decided not to patent this method, and thus he left unguarded the possibility of other workers, perhaps abroad, obtaining a monopoly of synthetic thyroxine by discovering the last step. As it happened, Dr. Harington was later successful in completing the synthesis, which was never patented. Though there is now no master patent, there remains the danger, however, that some foreign manufacturer may become possessed of some patent which though of minor importance in itself, would enable him to cut out the British manufacture by price competition, since the British maker would not be free to use the patented and consequently cheaper method.

(*c*) *Vitamin D.*—The example set by Toronto University has been followed by Wisconsin University. Steenbock patented the irradiation of foodstuffs for the purpose of rendering them antirachitic. The knowledge that some foodstuffs possess antirachitic properties and that the irradiation of animals, and even of their cages, cured or prevented rickets, had previously been reached as the culmination of much research in which British workers played a leading part. The University not only used the patent to demand royalties in this country for using knowledge which had to a great extent been discovered here, but also claimed that it covered a later and much more important discovery, which was unsuspected when the specification was drawn up. This discovery, largely to be credited to workers also in this country, and published without any idea of patent application, was that the substance Ergosterol becomes the true antirachitic Vitamin D, when irradiated. This is an instance of the unfair advantage which can be taken by those making full use of the patent system over those who refuse to do so. Attempts are now being made

by a foreign firm to gain control of the manufacture of Vitamin D by numerous patent applications concerning the particular conditions and methods of irradiating Ergosterol. The position has thus become further complicated.

It will therefore be seen that a new factor has been introduced into the question, namely, the exploitation of the results of British research by workers in other countries, who do not hold the same opinion in regard to the ethics of medical patents. This exploitation is usually effected by the well-known method of making a small improvement in the published method, and patenting it in this and other countries. In practice, this leads to the result that the British worker is prevented from using his own discovery. While there is a patent law which is freely used for medical inventions in other countries, and only half-heartedly so used in our own, because of the feeling of British medical research workers that it is improper to profit by royalties out of curing the sick, the present exploitation of the results of British research by other countries is bound to continue.

VI.

In this connection it is important to bear in mind that one of the underlying ideas in medical research is to discover new products which can be used by the medical profession for the treatment of disease and the alleviation of human suffering. To enable full use to be made of such discoveries, it is necessary that the production and sale of the new remedy shall be efficiently developed on an adequate scale. To do this, the co-operation of chemical manufacturers is necessary, but before a manufacturer can undertake the necessary financial commitments, it is only natural for him to expect some assurance that he will obtain a reasonable return on the outlay which is required to enable the manufacture to be taken up on such a scale, and in such a manner, that the remedy can be put cheaply at the disposal of the medical profession and the public in the most suitable form. Such an assurance is best obtained by some sort of protection against unrestricted competition; such competition is likely to defeat the object which at first sight it seeks to attain, viz., the improvement of quality and the reduction of price. In this connection it should be noted that part of the medical research carried out in this country is done in the laboratories of industrial companies, and if these concerns are to be in a position to maintain their research activities, it is essential that they shall have suitable protection either by patents or trade marks. The only alternative to this is the preservation of secrecy, which is undesirable.

VII.

Enough has been said to show that there are two points of view to be reconciled: (1) the objection of the medical research worker to patents on ethical grounds and (2) the desire for sufficient protection on the part of the manufacturer whose co-operation is essential if the public is to obtain full value from the discovery.

At present these two views are in opposition, but it is very necessary, both from the point of view of the medical profession and from that of national prosperity, that agreement should be reached.

The following suggestion has been made by the British Science Guild (Para. 18):—"That the interpretation of the word 'manufacture' should be extended so as to permit of the patenting of a wider range of biological inventions; and we think that the practical difficulties involved in such an extension are not insuperable. *Biological inventions subserving medical treatment should not, however, be patented in view of the strong contrary opinion of the medical profession.*" (The italics are ours.)

This proposal means, in effect, that medical remedies would be treated differently according to whether or not they are of a biological nature; some formula would therefore have to be devised to enable a decision to be made in any particular case as to the category in which a remedy fell. This would probably present considerable difficulty. Apart from the objections of the medical profession, it would seem that the proposal of the British Science Guild to differentiate between chemical and biological substances for medicine is illogical and does not afford a satisfactory solution of the problem. There seems to be only two alternatives to consider for medical inventions, viz., (*a*) no patents at all, or (*b*) a system of patents devised to reconcile the present conflicting views.

VIII.

The main objection to (*a*) has already been indicated, viz., that the necessary inducement would not be available to persuade firms to take up the manufacture of new remedies and that, as a result, the world at large would not reap the benefits it is entitled to expect from the new discoveries. There would also be a difficulty in that substances subserving medical treatment have in many cases other uses in respect of which a patent would be permissible; this should not, however, prove an insuperable difficulty.

Further, it is not certain that the abolition of medical patents would not lead to undesirable secrecy in place of free publication of the results of medical research. The patenting of a new drug means that the process of manufacture and the composition of the drug are published in the patent specification and the patentee is given a controlled monopoly for a limited period. A new discovery of this kind, when fully described, leads to the development of new ideas and to further investigations, all of which would be lost if medical patents were in this way replaced by "secret remedies."

In any case the abandonment of medical patents should not be adopted until international agreement on the subject is obtained. Unless the patent legislation in the different countries is brought into agreement, both research workers and manufacturers in this country will be placed at a very considerable disadvantage. If medical patents are excluded in this country, without similar action abroad, it will result in patents based on British discoveries, which would be freely at their disposal, being taken out in foreign countries, thus enabling foreign countries to make use of monopoly rights which would help them in introducing new medical products and retaining markets in those countries. The result will be that all markets in countries where patent legislation does not exclude medical patents will be in effect closed to British manufacturers. This will react to the detriment of the British medical profession and the public because the British manufacturers will thereby have their scale of production restricted, with adverse effects on the price, and the public will thus be the real and ultimate sufferers.

The importance of international agreement on this point cannot be too strongly emphasised, and if an attempt is to be made to draw a distinction between chemical and biological products and processes, it is essential that the procedure finally agreed upon shall be the same in all countries. In our opinion, no such alteration should be made in our patent laws before international agreement on the point has been reached. As such an agreement may not be reached for many years, it is necessary to give the most careful consideration to the other alternative.

IX.

In regard to (*b*) a suggestion has been made which warrants the closest attention of all parties as offering a possible means of arriving at a common basis of agreement. It is that provision should be made whereby Medical Patents should be dedicated to the British public and be administered by some Department of State. A suggested outline for the working details of such a scheme is attached. This scheme would work somewhat as follows:—Every British patent in respect of inventions subserving medical purposes (see definitions on page 32) would be dedicated to the British public and would be administered by a Department of State called for convenience the Medical Patents Trustee. It is intended that the Medical Patents Trustee should in practice act in consultation with an Advisory Committee, on which the medical profession would be prominently represented. The Medical Patents Trustee will be under an obligation to administer the patents in the public interest and grant as many licences as he thinks desirable to that end, or, if necessary, to declare the invention free and to allow no greater amount of monopoly than seems essential for securing the proper development of the invention.

The Trustee will offer the first *free* licence to manufacture in this country to the inventor or his nominee, and even if this licence is taken up, he may grant such additional licences as he may consider desirable for such fees as he may

determine, having regard to all the facts of each case. These fees will be paid to the Trustee and not to the inventor.

If the free licence is worked to the Trustee's satisfaction within the period which he stipulates, and here he will be guided by the advice of his Advisory Committee, he may not grant any other *free* licence, and this state of affairs will persist during the lifetime of the patent, provided that the working of the free licence is satisfactory. He may at any time, however, grant as many other licences with consideration as he thinks fit, and the fees may be as low as he choses to determine. If the first free licence is not taken up or is not worked satisfactorily, he may declare the invention free or grant as many licences, with or without consideration, as is desirable.

In deciding on the number of licences, the Trustee will keep in mind the difficulties which the manufacturer may have in developing the invention, the underlying principle being to ensure that the invention is utilised in the manner in which the public will derive most advantage both as to quality and price.

The inventor will have the first option of taking out foreign patents, and if he exercises this he can deal with foreign royalties in the usual way. Should the inventor not desire to exercise his foreign rights, the Medical Patents Trustee may, if he so determines, take out and administer the necessary foreign patents; he can determine the royalties to be imposed in respect of such patents, or he can declare them free as he thinks fit.

If it be argued that it is undesirable that the Medical Patents Trustee, being a public official, should take out and administer foreign patents, it is recommended that the option to take out foreign patents lie only with the inventor or his nominees.

It is the intention that royalties imposed by the Medical Patents Trustee should be of a nominal character, and should not more than suffice to cover the expenses of administering the dedicated patents, any surplus which may accrue being devoted to medical research.

By making such dedication compulsory for all patents for inventions subserving medical purposes, whether taken out by British or foreign workers, the principle would be safeguarded that there can be no uncontrolled monopoly in Great Britain, publication would be assisted, and British workers would be protected from exploitation. Further, the administration of the patents by a Department of State would allow of an effective control over manufacturers by a system of licences, and would provide the necessary inducement for firms to develop the new remedies. Thus the scheme meets both the points of view indicated in the first paragraph of Section VII, and in particular allows the medical worker to contribute to the application of new knowledge by patent publication without the least suspicion that he is monetarily interested.

Chemists Honoured at Durham

Degrees for London Professor and Billingham Director

DISTINGUISHED chemists were honoured by Durham University on Thursday, June 26, when the honorary degree of D.Sc. was presented to Dr. Frederick George Donnan, F.R.S., Professor of Inorganic and Physical Chemistry at University College, London; and Dr. Roland Edgar Slade, managin director of Synthetic Ammonia and Nitrate, Ltd., at Billingham.

At the ceremony Dr. Irvine Masson presented Professor Donnan, whom he described as the most brilliant representative of physical chemistry in Britain to-day. During the past 30 years he had directed and had inspired an exceedingly large volume of researches in practically every branch of physical or inorganic chemistry, and his work had been pioneering, illuminating, and decisive.

Dr. Masson also presented Dr. Slade, whose researches, he said, had been the means of making the County of Durham a world-centre of one of the chief material agents that supported present-day civilisation. The present synthetic ammonia factory at Billingham could not have existed without the researches of Dr. Slade and those who shared the investigations he directed. The great industry of which Dr. Slade was captain was literally a creator of food in the form of fertilising compounds of nitrogen, on so large a scale that it could make and distribute all over the world what was equivalent to the food of hundreds of thousands of human beings annually.

The Turner Retort

Report of the Fuel Research Test

THE report of a test by the Director of Fuel Research on the Turner retort installed at the works of the Comac Oil Co., Ltd., Coalburn, Lanarkshire, is contained in a paper issued by the Department of Scientific and Industrial Research (H.M. Stationery Office, 30 pp., 9d. net).

The retort is of the vertical, continuously working, internally heated type, the heating being carried out by superheated low-pressure steam injected into the base of the retort. According to the statement of the inventor, when applying for the test, a special feature of the process is a vapour outlet valve at the top of the retort, "so arranged that it remains closed until the steam entering the retort has raised the pressure therein to a desired maximum, when it opens instantly and remains open until the pressure has dropped to a desired minimum, when it closes instantly." He claims that "whilst the valve is closed the steam is pressed into all the voids between the material and, being practically at rest, transfers heat to the material with which it is in contact until they attain the same temperature. When the valve opens the steam expands, drops in temperature, and rushes through the valve into the condensers, carrying with it the vapours released by the drop in pressure from the material possessed of the necessary temperature to produce them. At that instant the material is actually at a higher temperature than the steam by which it was heated. The volatile, therefore, is released into a steam atmosphere at a lower temperature than its own temperature of formation. In this way the hydrocarbon vapours are prevented from coming into contact with anything as hot as themselves. The result is the maximum recovery of hydrocarbons in the liquid form and the minimum or non-production of gas."

The summary of the report states that although the plant appears at first sight complicated owing to the many mechanical devices installed, it proved to be simple in its operation and the mechanical devices functioned satisfactorily during the period of the test. The yields of products per ton of coal were :—

	As charged with 13·3 per cent. moisture.	Calculated to dry coal.
Coke .....cwt.	12·18	14·05
Tar .....gal.	19·16	22·1
Gas spirit ..... ,,	1·7	2·0
Liquor ..... ,,	464	500
Gas, volume .....cu. ft.	2,400	2,765
Gas, therms .....therms	18·96	21·84

The coke produced was suitable as a fuel for burning in a domestic fireplace, but it was not entirely smokeless. The yield of tar was 69·3 per cent. of the yield obtainable in the Gray-King assay. The gas produced was high in calorific value (790 B.Th.U.) and could be used as a source of heat in the steam superheater. By efficient scrubbing of the gas 2 gallons of crude light spirit could be obtained from 1 ton of coal. The power used on the plant was small.

"The Cabinet Maker" Staff Dinner

To celebrate the fiftieth anniversary of the publication of *The Cabinet Maker*, which was founded by the late Sir John Benn and the Jubilee number of which was issued last week, the staff of the journal held an informal dinner on Friday last at the Strand Palace Hotel. It was agreed that no speeches should be made and that the event should be regarded purely as a friendly expression of the general goodwill of the staff towards one another and to mark the occasion by a function free from any kind of formality. The menu of the dinner contained on the title page the words "The Staff of *The Cabinet Maker* Enjoy a Jubilee Dinner, June 27, 1930," and the bright and lively contributions from various sources which followed appeared in the form of a series of couplets, each referring by name to one of those present. It was entitled "About Ourselves," the introductory verse reading :—

Below we give in neat artistic form
The Characters of those who every week perform
The arduous task of giving to our readers,
A journal packed with ads., and news and leaders.

After the dinner the staff attended the performance of *A Night Like This* at the Aldwych Theatre, thus bringing to an end a most entertaining and enjoyable evening.

The Avery Bicentenary

Celebrations at the Soho Works

THERE was, on Tuesday, a very large party, drawn from different parts of the country, at the famous Soho foundry, near Birmingham, of the firm of W. and T. Avery, Ltd., to celebrate the bicentenary of the firm. To have existed for two centuries, and in addition to have maintained a front place in a highly scientific industry throughout the rise of other new industries, the change in industrial conditions, the introduction of new processes, the discovery of new types of metals and alloys, and all kinds of new demands for instruments of precision in weighing and calculating, is a record to be proud of, and throughout the works, from the highest to the humblest workers, there is a spirit of proper pride in the history and traditions of the concern and in its products and position to-day. Machines that will check the housewife's purchases to the fraction of an ounce, record the weight of each truck in a long train as it passes on its journey, will poise to the minutest degree of accuracy the propellers of aeroplanes, will take a 100-ton steel girder, and give the correct weight of a silken thread or a strand of hair, were brought to the notice of the visitors.

The works stand, as one speaker said, on historic ground. The three names most closely associated with the early stages are those of Matthew Boulton, James Watt and William Murdock. The business had its birth in an obscure workshop in Digbeth, where a " stilliard " maker named Ford carried on a small trade. In the early years of the nineteenth century William Thomas Avery came into the concern, which was transferred in 1897 to Soho.

The visitors were interested in the relics of the early days of the foundry—the row of cottages, to one of which Murdock came to live, the entrance gate built by Boulton, the ancient gasholder, the first in the world—and now, alas! rapidly decaying—erected by Murdock, and the old drilling machine designed for the machining of the cylinders for Watt's earliest steam engines, and on which Mr. William Byfield, the oldest employee of the firm, has been working for the past sixty-four years.

Congratulatory Speeches

After a tour of the works the visitors were entertained to lunch, Sir J. Fortescue Flannery, the chairman of the company, presiding.

Proposing the toast of " The Old Firm," Sir Walter Raine, president of the Association of British Chambers of Commerce, referred to the early history of weighing machines, and illustrated how they had been brought to a degree of perfection amid surroundings famous in engineering history.

Sir J. Fortescue Flannery, in acknowledging, described Soho Foundry as occupying as historic a place in the annals of engineering as Waterloo occupied in the history of military achievements. It was the home of great inventions and of scientific developments which had put Great Britain in the van of progress throughout the world. " From the earliest recorded history," he added, " men have been weighed in the balance and found wanting, and so by mutual consent the process was determined that goods bartered should be weighed in the balance and not found wanting."

Mr. G. N. Barnes, responding to the toast of the guests, submitted by Sir Gilbert Vyle (managing director of W. and T. Avery), said to-day, more than ever before, the representatives of employers and employed stood on a common platform, engaged in the consideration not only of problems connected with industry but of those connected with the general well-being of the workers. That, to him, was a significant and encouraging fact. They now met more in the spirit of co-operation. It was encouraging that they should look upon industry and social problems, not from the narrow, isolated view of class, but from the larger standpoint of the good of the whole community. These were troublous times. They were times when they could not afford conflicts. They were too costly. Looking at the position from the point of view of our own country, what did they find? At one time we used to import raw materials from the ends of the earth, and exported them in terms of finished products pretty well on our own terms. To-day all the nations of the world, who used to be our customers, were doing things for themselves. He hoped they would continue to do them. He did not regard them with any fear. He did not regard industry as something by which we gained at the expense of other people. His conception of the situation was that we were all, internationally, of one family.

Mr. Alexander Ramsay also responded to the toast, and referred to the traditions which had gathered around Soho Foundry; but generations of men, steadfast, capable and far-seeing, had built on that tradition instead of relying on it.

" Smoke and Health "

THIS is the title of a lecture delivered at the Manchester College of Technology by Dr. J. S. Taylor, assistant medical officer of health for Manchester. Dr. Taylor discusses in the most practical way the problem of atmospheric pollution—the physical effects of the impurities comprised under the term " smoke " and the psychological effect of gloom.

" Anything," he states, " which will prevent injury or which will improve the well-being of a race is deserving of our profoundest attention and concentration. During the last 50 years the problems of pure water supplies, efficient sewage disposal, epidemic disease and housing have all been faced with a certain degree of success. There remains in atmospheric pollution one of the greatest enemies of health, an enemy persisting through the uneconomic and unscientific methods of producing power and heat for our industrial and domestic purposes. Practically all the smoke nuisance from which we suffer is due to the use of bituminous coal for heating purposes, both in the factory furnace and in the domestic hearth. It is composed of carbon, hydrocarbons and ash, (*i.e.* volatile matter and coke) with a varying amount of sulphur and moisture. Completely burnt, these constituents are converted into carbon dioxide, water and sulphur dioxide, the ash alone remaining. In this state these compounds are comparatively harmless, but complete combustion is almost a practical impossibility in the fireplace and furnace as designed to-day."

False Description of Lead Paint

AT the Tower Bridge Police Court, on Monday, the London Chamber of Commerce charged the Hamilton Trading Co., Ltd., with (1) giving a false description of white lead paint which was not white lead paint, and (2) selling white paint described as white lead paint. H. D. W. Menear said that he went into the defendants' shop to purchase some white lead paint, in consequence of an advertisement he saw in the window, the ticket bearing the words " English stamped white lead." He paid 3s. 9d. for a 7 lb. tin. Horace Baker, an employee of a firm of decorators, said he was sent to the defendants' premises with a written order for " 7 lbs. of genuine white lead paint." He was supplied with a tin of white paint similar to that supplied to Mr. Menear, and paid 3s. 9d. for it. Mr. W. Russell-Smith (Teschemasher and Smith, analytical chemists), said his firm had received two samples of the paint in question. In each case the percentage of lead was 0·04.—Mrs. Beer, a director of the defendant company, said there was no wilful intention to defraud. When they received a letter from the Chamber of Commerce they supplied them with the name of the manufacturer and had the tickets altered. The firm relied upon the assurance from the manufacturers that the paint contained English white lead.—The defendants were fined £15, with costs amounting to £25.

Coal Carbonisation in New Zealand

IT is announced that progress is being made with work preparatory to the erection of the coal-carbonisation plant at Rotowaro for Waikato Carbonization, Ltd., for the treatment of slack from Taupiri, Pukemiro, Waipa and Renoun mines. About 1,000 tons of plant have been procured in Germany, the home of the Lurgi process. The shipment includes material for buildings, which will be of steel.

New Benn Books

FORTHCOMING publications by Ernest Benn, Ltd., include the following:—*Thoughts of a Soldier*, by General Von Seeckt, translated by Professor Gilbert Waterhouse, 8s. 6d.; *The Documents in the Case*, by Dorothy Sayers and Robert Eustace, 7s. 6d.; *Dust to Life*, by Peter Burton Thom, M.D., illustrated, 21s.; *India*, by Sir Valentine Chirol, 15s.; *No Walls of Jasper*, by Joanna Cannan, 7s. 6d.

Unemployment and Work

By Sir Ernest J. P. Benn

In the last article of this series, Sir Ernest Benn deals with the disastrous effects of modern methods of government, which he characterises as "an evil spirit working behind a mask of public service." Previous articles in the series appeared in THE CHEMICAL AGE *of May 3, 10, 17, 24, 31 and June 7, 14, 21 and 28.*

X—Service the Solution

No surprise that Mr. Thomas has failed to solve the unemployment problem will be felt by anyone who has followed this little series of discussions of the matter. The trouble lies deep down in our way of looking at things, and is not susceptible to some simple legislative device or to financial manipulation on however big a scale.

In a previous article I drew a contrast between America and England, and in a couple of quoted sentences endeavoured to summarise the two widely different points of view of the two countries. I gave voice to Uncle Sam and John Bull as, it seemed to me, they were talking to their working sons. But John Bull is committing a double error. Not only is he encouraging the workers to develop a spirit of dependence and irresponsibility, but he adds to that every form of discouragement which can possibly be heaped upon the efforts of the business classes and all those on whose initiative and enterprise the well-being of any nation must always depend.

Conspiracy Against Business

Wherever we go we find the business man depressed and disheartened, still struggling, but for the most part doing it without a will and with a dismal sense of weary futility. When we remember what the modern John Bull is saying to his business men, this disastrous attitude is easy to explain and understand. Surely it is something like this:—

"You are all wrong. You are working for a profit and that is an unsocial thing to do. Some day or another some public authority will take your place. Meanwhile get on with your job. If you succeed we will take half your success from you, part of it year by year as it occurs, and most of the rest when you die. You are not to be trusted, and so from day to day, whatever you desire to do, you must fill up forms and submit to the orders of officials who will stand at every corner to keep an eye on you."

Is it not rather wonderful that in such a situation there is as much trade and employment as there is? Mr. Norman Douglas says that "all government is a conspiracy against the superior man," and while it would be absurd to suggest that all business men were superior, it is certainly true that all those who can be described as superior in the practical work of society are to be found among the business classes.

That government is a conspiracy against business is a truth the full significance of which we have yet to realise. It is easy to agree that the abolition of the Sunday post is a good and convenient arrangement for the postman, but much more difficult to trace its detrimental effects upon the prosperity of all the rest of us. There is so much interest in the details of day-to-day political manœuvre and discussion that to see the whole problem and formulate principles and act in accordance with them is really difficult, even for the most experienced of us. Yet the successful conduct of a democratic system will not be achieved until we have developed the ability in our people to go deeper into the workings of human affairs than they seem able at present to do.

Habits of Grovel and Greed

A distant observer of our doings in, say, Mars, would not concern himself with the fate of the government of the day. He would not care whether Mr. Churchill had the better of Mr. Snowden in last night's debate, nor would he worry because sugar came from Germany or beef from the Argentine. What would strike him would be the presence on the earth of an evil spirit working behind a mask of public service, talking loudly of ideals and generating the habits of grovel and greed, a spirit clever enough to use the name of liberty to abolish all freedom.

Such an observer would label this all-pervading evil genius "government" or "state," and would recognise below the superficial jargon of our daily talk the real things that it is saying to us. To the working man and the rank and file it is the spirit of servility. They are told, not in so many words, but in more effective ways, that they have no brains, no initiative, no ability; that they are mere automatic cogs in a machine which is outside their control, that they must do as they are told, and that success in life depends upon rules and regulations and the accurate filling up of forms. The only variation in this story is at election times, when, with a successful effrontery, these same automata are bamboozled into thinking they really have both brains and power.

To the business man the great evil genius of this unfortunate generation is more direct and more truthful. It says bluntly, as we have seen: "You are an error, you must be discouraged and eventually stopped."

These would be the reflections of an observer at a sufficient distance to be insusceptible to all the deceits of modern politics. For us, nearer to our own public meetings and our committees and our newspapers, it is a good deal harder to see the truth. We find it sometimes very difficult to draw the line between mere bluff and ignorant enthusiasm. We note words and forget their meanings. Consider, for example, the use of the word "service" in connection with trade unionism. There are thousands of unionists who have befooled themselves into believing that some sort of service is done by observing rules to enforce idleness. In a world in which masses can pretend to find some satisfaction in a condition of slavery because it is labelled "Dictatorship of the Proletariat," we seem to have lost a due regard for the meaning of words. Thus "bossing by agitators" is commonly called "self-determination," and the most complete system of protection ever offered to man is calmly labelled Empire "Free Trade." There can surely be little doubt that the modern spirit of grovel and greed has done its work well. Until, therefore, we can generate a new spirit amongst us there is little hope for a betterment of the employment position, for unemployment is not an isolated, independent thing like a broken leg, it is more like a nervous breakdown due to the bad or irregular use of a life.

The Spirit of Service

We must begin by resuscitating the spirit of service, at the same time being sure that we understand what service is. We must learn the long-forgotten truth that it is we who render service, a very different conception from voting for service at the expense of others. The spirit of service will lead us each to think that after all there may be something wrong with us—ourselves—each one of us, a very different idea from the popular notion that all evil resides in the other fellow. Having got thus far, we shall have the delight of discovering a satisfaction in personal service to others, which even to-day makes our private lives tolerable, but the denial of which makes our public affairs damnable.

We work, of course, in a way for ourselves, or at all events it looks like that, and because it looks so, we have built up a false and easy philosophy which can roughly be called Socialism, for Socialism to-day spreads far beyond the limits of the Labour Party. But while we may work for ourselves, we can do ourselves no good, we can make no gain, we can get no satisfaction, unless we render acceptable service to others. The organising and arranging of our work, in our own interests alone, gets us nowhere, and that is what we all seem to be striving after. A better understanding of the paradox of service is, therefore, essential. The literary worker or the novelist, gives, perhaps, better than most the clue to the puzzle of work and its purpose. Most of these people write because they like it and because they want money. But their work itself and all its objects, whatever they are, fail in every respect unless others can be induced to read what is written. The novelist has, perforce, to produce his article before a price can be put upon it. He cannot know until the work is done whether he will receive much or little, or, indeed, any payment at all. He never thinks—it is useless his doing so—about hours or rates or conditions or pensions: he must render his service first and then wait for others to decide whether they will or will not offer him any remuneration.

Nobody in his senses would suggest that the miner or the 'bus conductor should work on such terms, but it is both wise and useful for us all to remember that, fundamentally and scientifically, there is no difference between the dependence of society as a whole on the efforts of all these workers. Giving must come before getting, and the prevalence of the spirit of "getting first" is something to do with our economic plight.

All this can be reduced to the language of commerce in the simple phrase, "the customer is always right," or to the language of economics in the time-worn and discarded truth that "the buyer settles the price."

In these articles I have laid myself open to the charge of easy generalisation. I have said little or nothing which can help the out-of-work in his difficulties with to-morrow's dinner, but I make no apology. We get deeper and deeper into the mire as we pile up temporary makeshifts in face of our day-by-day difficulties. The unemployed are nearing the two million mark, and, if we continue in our present ways, we shall be faced with three millions of them before next summer, and the numbers will rise in geometrical rather than arithmetical progression. But we are learning very rapidly.

It is now apparent, as it has always been true, that the conscience of the people is better than Acts of Parliament, and that there is more good in the heart of the individual than in the voice of the mob.

Nitrate Merger Progress

DETAILS are given in the half-yearly report of Aikman (London) Ltd., the well-known nitrate brokers, of the progress with the amalgamation of all Chilean nitrate producers into one company, to be known as "Compania Salitrera Nacional" (Cosana). A special law to confer the charter on the company was approved by the Chilean Chamber of Deputies on June 27 with certain modifications, and is expected to be passed by the Senate early this month. As soon as "Cosana" is inaugurated, it is proposed to form a subsidiary company in London, which will take over all the work connected with propaganda, distribution, finance, freights, etc., at present attended to by the Producers' Association. The concentration of production and distribution, together with the abolition of West Coast agents, is expected to result in large savings, estimated at not less than £1 per ton, in addition to £2 10s. per ton saved through the cancellation of the export duty. The negotiations between the Chilean Government and individual producers, with a view to arriving at a basis for an exchange of shares, have already resulted in terms being arranged with about 95 per cent. of the industry, and a committee will shortly be set up in Valparaiso to fix a basis for those outstanding.

Manufacture of Synthetic Benzine

IN his address to the shareholders of the "Shell" Transport and Trading Co. last week, Lord Bearsted referred to the fact that the Royal Dutch-Shell group had been giving great attention to processes for the manufacture of synthetic benzine either from coal or from oil. He stated that a most important step in this direction had been reached in that the group had now arranged to join hands with the Standard Oil Co., of New Jersey, and the I.G. He added: "All the experience and patents of each of us will be exchanged and shared in order that the vast problem of hydrogenation, as it affects our industry, may be worked out conjointly. Our partners in this venture will unite with us in concentrating in one central body all patents and processes by which high-grade products can be made from different raw materials on the widest possible scale."

Prince's Visit to Billingham

DURING his visit to Middlesbrough and Stockton on Wednesday the Prince of Wales visited the works of Synthetic Ammonia and Nitrates, Ltd., at Billingham. He was received by Lord Londonderry, the Lord-Lieutenant of Durham, and Lord Melchett, the Chairman of Imperial Chemical Industries. Lord Melchett presented Viscount Castlereagh and the directors of the company, after which the Prince visited the cement works, the nitrate factory, where immense quantities of fertilisers are made, the coal-oil experimental plant and the research laboratories. On leaving, the Prince was greeted by thousands of people.

International Nickel Position

New Plants in Use

A CABLE, received by Lord Melchett, chairman of the advisory committee of the International Nickel Co. of Canada, from Mr. Robert C Stanley, the president, is issued for the information of English shareholders The president has just returned from an inspection to all Canadian properties, and states that the Frood Mine is now producing at the rate of 90,000 tons of ore per month, which rate can, when required, promptly be increased to 125,000 tons per month. In addition, the Creighton Mine is producing 50,000 tons of ore per month and the Garson Mine 20,000 tons of ore per month. The new smelter is now in operation two months in advance of schedule.

The new electrolytic copper refinery of the Ontario Refining Co. is practically completed and will be producing copper within sixty days. The company's new plants are ready to meet the demand for nickel, upon business revival. There has been no abatement in the activities of the research and development departments. The volume of business during the second quarter is somewhat less than during the first quarter. Taking all facts into consideration, the administration is more optimistic regarding the company's future than at any time in the past.

Lord Melchett adds that he is very well pleased with the situation in Canada, and emphasises, for the information of shareholders, the importance of the Frood Mine, which is now beginning to produce ore on a large scale. The company will, within a few months, have the advantage not only of a new smelter but also of a new copper refinery in Canada, and an enlarged precious metal refinery in London, so that all the products of the company's mines will be treated under the most modern conditions.

River Pollution Reports' Proposals

Local Authorities' Increased Powers

THE second report of the Joint Advisory Committee on River Pollution makes recommendations on the reception of trade effluents into the sewers of local sanitary authorities. The committee suggest amendments of the River Pollution Prevention Act, including clauses stating that the sanitary authorities should be under a general obligation to take and dispose of trade effluents. Regulations should be settled by agreement with representatives of traders and questions in dispute should be determined by the Minister of Health. The local authority should be enabled to provide separate sewers for the disposal of wastes, and should be authorised to execute works on a manufacturer's behalf and at his expense if the works are necessary to comply with the regulations.

Other recommendations are that a local authority should be enabled to enter into special agreements, that certain substances should still be definitely excluded from the sewers, and that nothing should affect existing riparian rights in the volume of water or relieve the trader of existing obligation.

The Thomson Medal for Chemistry

AT a meeting of the London University Court on Wednesday the offer of Professor S. Smiles, F.R.S., and Professor A. J. Allmand, F.R.S., to found a Medal to commemorate the services rendered to King's College and to chemical education by Professor John Millar Thomson, LL.D., F.R.S., was accepted with thanks.

Professor Thomson first became a member of the staff of the Department of Chemistry at King's College in 1871, and retired in 1914, after having served for 27 years as Daniell Professor and Head of the Department of Chemistry. The medal will be known as the John Millar Thomson Medal for Chemistry, and will be awarded annually to the student of King's College who most distinguishes himself in the final year of the Special Honours Course in the Department of Chemistry.

The thanks of the University were accorded to the Kestner Evaporator and Engineering Co., Ltd., and to their Chairman and Managing Director, Mr. J. A. Reavell, for their gift to King's College of a still of works pattern for use in the Chemical Engineering Laboratory. The still has been specially designed for the college for experimental purposes and is particularly adapted for research work.

From Week to Week

THE NITROGEN PLANT of the Mont Cenis colliery, in the Rhine Province, it is announced, has been acquired by the I.G. Farbenindustrie.

THE SWEDISH ECONOMIC REVIEW for 1930 reports that in the pulp industry sales have been fairly good, but prices have been weak, especially for chemical pulp.

MR. JAMES MORTON, chairman of Scottish Dyes, Ltd., had the Honorary Degree of LL.D. of the University of St. Andrews conferred upon him at the Graduation Ceremony on June 27.

A BRONZE PORTRAIT of Lord Brotherton by Mestrovic is among the interesting exhibits at the Yugoslavian Sculpture and Painting Exhibition which was opened at the Leeds City Art Gallery on Monday.

PROFESSOR F. W. ASTON, of Cambridge University, has received the honorary degree of Doctor of Natural Philosophy from Freiburg University in recognition of his services to physics and chemistry.

SIX PEOPLE WERE KILLED in accidents in chemical factories in Great Britain and Northern Ireland during May out of a total of 200 (excluding seamen) of all industrial accidents. During the month six cases of chrome ulceration were reported among chrome plating workers and three among those engaged in dyeing and finishing.

MR. G. M. MOIR, the present holder of the Pegler Scholarship awarded by the Institute of Chemistry, is about to complete his work on "Methods for the determination of casein, albumen, and globulin in milk, and the consideration of any points arising therefrom." It is hoped that arrangements will shortly be made for the publication of the results.

THE EXECUTIVE BOARD of the Heavy Chemical Group of Imperial Chemical Industries, Ltd., this week made a tour of inspection of their works in the Widnes district. The party included Messrs. Holbrook Gaskell (chairman), Akers, R. H. Davidson, E. O. Glover, W. Calder, R. J. Wait, Herapath, and Dr. Conroy. Lord Melchett was not with the inspecting group, as was rumoured.

A LEVY ON WOOL imports has been imposed by the Woollen Industries Research Association with a view to raising the £20,000 annual income necessary for the Association to get the maximum grant from the Department of Scientific and Industrial Research, which pays pound for pound, up to a maximum of £10,000 per annum, in respect of all income raised by the Association in excess of £10,000.

THE EARL GREY MEMORIAL FELLOWSHIP of Armstrong College, Newcastle-on-Tyne, has this year been awarded to Mr. Thomas Gibson Pearson, who obtained the degree of B.Sc. with First Class Honours in Chemistry in 1928, and has since been engaged on research work upon the polysulphides of the alkali and alkaline earth metals. Certain techniques have been developed on the Continent in recent years in connection with the problems which Mr. Pearson is investigating, and he proposes to spend some time in the laboratories of Professor Paneth and Professor Noddack in Berlin.

THE COUNCIL OF THE INSTITUTE OF CHEMISTRY has been invited to nominate a delegate to the tenth Congress of Industrial Chemistry, organised by the French Society of Chemical Industry, to be held at Liège from September 7 to 13 next, and also to appoint a representative to attend the tenth International Conference of Chemistry to be held at Liège from September 14 to 20. Delegates will be appointed at an early meeting, and, in the meantime, the Council will be glad to hear from any Fellow who intends to be present at the Congress, in order that the organisers may be notified.

THOMAS W. WARD, LTD., the Sheffield firm of dismantlers, have acquired the undertaking and assets of the Midland Coal, Coke and Iron Co., Ltd., Apedale, Staffordshire, comprising the freehold estate of over 2,000 acres, together with coal and mineral rights, collieries, blast furnaces, coke ovens and by-product plant. This undertaking once had a weekly output of 14,000 tons of coal, 1,000 tons of pig iron, 2,000 tons of coke, 8,000 galls. of benzol, and 30 tons of tar, and 3,000 men were employed at the collieries and works. There are 82 coke ovens of the Simon-Carves regenerative type and the by-product plant embraces the recovery of tar, ammonia and benzol, the manufacture of sulphate of ammonia and distillation of tar.

A GRANT OF $2,500,000 (£281,250) for special research and propaganda for the general benefit of the rubber industry, recently proposed by the Government of the Federated Malay States, has been approved.

NEW WORKS AND OFFICES of the Gas Light and Coke Co., Ltd., were formally opened by the Lord Mayor, at Bow Common Lane, on Monday. The works which were first opened in 1853 have been entirely reconstructed to enable the company to produce 100,000 cubic feet of gas per minute.

A GRANT OF £200 has been made by the Royal Society, for apparatus to facilitate X-ray work on textile fibres, under the Clothworkers' research scheme at Leeds University. The work is under the direction of Mr. W. T. Astbury in collaboration with Mr. J. B. Speakman on the physico-chemical side.

CANADIAN INDUSTRIES, LTD., have completed arrangements for the construction of a new fertiliser plant at Beloeil, Quebec. A similar plant is also being erected at Hamilton, Ontario. The plant at Beloeil will manufacture not only mixed fertilisers but superphosphate, and is expected to be producing by September next.

J. F. CROWLEY AND PARTNERS, of 11, Queen Anne's Gate, Westminster, S.W.1, announce that they have acquired the lease of Westminster House, Great George Street, Westminster, London, S.W.1, which affords considerably larger and more convenient accommodation, particularly for their laboratories, and from June 23 their offices have been transferred to that address. The telegraphic and cable addresses and telephone numbers remain unchanged.

IMPERIAL CHEMICAL INDUSTRIES, LTD., held their annual sports at Billingham on June 28. The events included a competition for the I.C.I. trophy, dog show, bowls tournament, and motor gymkhana. South Midlands won the inter-divisional championship with 41 points, the other placings being: London and Southern Counties (36), Scotland (32), North-East (31½), Cheshire and North Wales (28½), North Midlands (27), and North-West (24).

LORD MELCHETT, chairman of Imperial Chemical Industries, on Tuesday opened a new recreational centre for the employees of Synthetic Ammonia and Nitrates, Ltd., one of the associated companies, at Billingham, Stockton. The buildings consist of a main pavilion and three isolated pavilions, or stands, for tennis and cricket, Rugby football and Association football. There is also an entertainment hall, designed to be used as either a theatre, cinema, dance room, or social functions. Dr. Slade, managing director, presided. Lord Melchett said it had always been a tradition, in the companies with which he had been associated all his life, that good housing, good conditions, and sports clubs were part of the responsibility of large industrial concerns.

MR. HARRY WILLIAM WEBB, who since 1928 has been Principal of the Aston Technical College, Birmingham, has been appointed chief assistant to Dr. J. W. Mellor, F.R.S., in the Pottery Department of the North Staffordshire Technical College at Stoke, at a salary of £900 per annum. Mr. Webb was educated at Birmingham University, and during the war served on the chemical staff of the Ministry of Munitions. He became assistant manager of H.M. factory at Oldbury, and later superintendent of the Research Department. In 1919 he was appointed head of the Chemistry Department at Cardiff Technical College, and moved to Aston from Cardiff. He is an active member of the Birmingham and Midland Section of the Society of Chemical Industry.

Obituary

MR. GEORGE ANTHONY HAVELOCK, of Havelock and Usher, chemical manure manufacturers, Newcastle, at Monkseaton, on June 24, at the age of 74.

DR. HARVEY WASHINGTON WILEY, at Washington, U.S.A., on June 30, at the age of 85. Dr. Wiley started his career as a professor of classics, but took up science, and in 1874 was appointed Professor of Chemistry at Butler University. He became State Chemist of Indiana, and from 1883 to 1912 was chief chemist of the United States Department of Agriculture. Afterwards he was Professor of Agricultural Chemistry at the George Washington University. He was the author of numerous scientific papers and Government bulletins and held degrees and distinctions awarded by universities in various countries. He was made a Chevalier of the Legion of Honour in 1909.

Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Accepted Specifications

328,381. AMINES. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, March 11, 1929.

Primary amines of the aliphatic or aromatic series are obtained by heating unsaturated aliphatic or aromatic aldehydes or ketones in the vapour phase with hydrogen and ammonia in presence of a hydrogenatibg catalyst. To avoid resinification of the aldehyde or ketone it is preferred to lead a mixture of the vapour with fresh hydrogen to the reaction vessel, where it is mixed with a preheated circulating mixture of hydrogen and ammonia. The preferred catalysts are those containing a metal of the eighth periodic group and activating additions of difficultly reducible oxides of metals of the fifth and sixth groups.

328,383. DYEING. O. Y. Imray, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, March 12, 1929.

Preparations for use in the production of azo dyes upon the fibre comprise mixtures of a nitrosamine alkali metal salt, a diacetoacetylarylide, a feebly acid substance sufficient to neutralise the excess of alkali, and a water-binding salt. Specified mixtures are (1) the nitrosamine sodium salt of 4-chloro-2-anisidine, sodium bicarbonate, anhydrous sodium acetate or Glauber's salt, and diacetoacetyltolidine, (2) the nitrosamine sodium salt of 2-5-dichlor aniline, anhydrous Glauber's salt, and diacetoacetyltolidine ground together in presence of carbon dioxide or with sodium bicarbonate, (3) the nitrosamine sodium salt of 4-chloro-2-anisidine ground with boric acid, anhydrous Glauber's salt, and diacetoacetyltolidine.

328,388. WASHING GAS LIQUORS. A. L. Mond, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, March 15, 1929.

Phenolic compounds are extracted during the washing of gas liquors by the use of trialkyl, triaryl, or triaralkyl phosphates, such as tricresyl phosphate. The phenols are then separated from the solution by distillation or by treatment with alkali, separating the aqueous layer, and acidifying. Pyridine and other amines and neutral oils are also soluble in the extracting agents, and may be separated by blowing steam through the alkaline washing agent prior to the acidification.

328,516. GAS TAR RECOVERY. R. R. Ripley, 4439, 70th Street, Portland, Ore., U.S.A., and S. C. Schwartz, 1229, East Glisan Street, Portland, Ore., U.S.A. Application date, July 29, 1929.

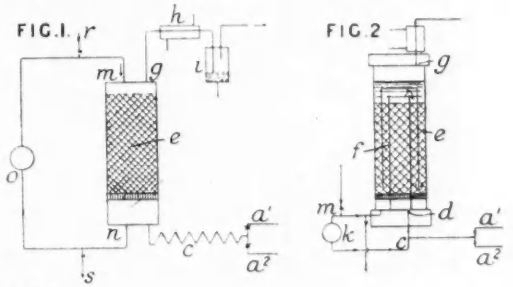
To recover tars from their aqueous emulsions a demulsifying agent such as caustic soda solution is added in the proportion of 0·06 per cent., and the mixture is rapidly heated to boiling under atmospheric pressure. Heating is then continued to 320° F. and pressure of 75 lb. per square inch until the water particles coalesce. Heating is then discontinued and pressure gradually released and the tar allowed to settle for 12–36 hours, when the tar is recovered as a distinct layer. The tar is heated in a horizontal cylindrical boiler provided with steam coils, and a number of test outlets at different heights by which the liquid is sampled.

328,572. ACETIC ANHYDRIDE. O. Y. Imray, London. From Akt.-Ges., für Stickstoffdünger, 14, Georgsplatz, Cologne, Germany. Application date, January 29, 1929.

Liquid acetic acid is treated with phosgene in the presence of metals whose chlorides are converted into acetates by boiling with acetic acid, and whose acetates easily lose acetic acid, *e.g.*, metals of the second and third groups, particularly magnesium, barium, calcium, strontium, and aluminium, also metals of the iron group, cerium, and other rare earth metals. In an example, a mixture of acetic acid and aluminium chloride or magnesium acetate is heated to boiling and phosgene passed through. Acetic anhydride is obtained.

328,586. HYDROCARBONS AND THEIR OXYGEN DERIVATIVES. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, November 26, 1928.

Carbonaceous gases or liquids are hydrogenated at temperatures of 300°–700° C. and pressures above 20 atmospheres in the presence of catalysts. The deposition of high molecular substances on the catalyst is prevented by adding a high boiling organic liquid such as anthracene oil. The added



328,586

liquid may contain the dispersed catalyst, and may be renewed continuously or periodically, and the catalyst filtered off and regenerated. The catalyst may be a metal or compound of the sixth group.

Carbon monoxide and oxygen are passed through a heating coil *c* and then at 390°–400° C. over a catalyst *e*. Higher alcohols are obtained and pass to the condenser *h* and receiver *i*. A pump *o* circulates anthracene oil continuously through the catalyst.

In another example, hydrogen and gas oil are mixed at the point *c* with a heavy oil boiling above 325° C. obtained by the destructive hydrogenation of coal. The mixture passes through a pipe *d* into a reaction vessel *e* containing a catalyst of chromium or molybdenum. The heavy oil is circulated by a pump *k* and the reaction is effected at 450° C. and 200 atmospheres pressure. The low-boiling hydrogenation products are drawn off at *g*.

328,587. MOTOR FUEL. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, Dec. 22, 1928.

An anti-knocking fuel is obtained by adding to saturated hydrocarbons polymers of lower olefines, *e.g.*, di-isobutylene or polymers, or amylene polymers, or mixtures.

328,592. PURIFYING GAS. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, January 18, 1929.

Combustible gases, carbon monoxide, hydrogen, etc., are freed from phosphorus or its compounds by mixing with oxygen or air and passing over a contact mass which causes oxidation of the phosphorus and absorbs the phosphorus oxide. The catalyst may be a metal of the first, third, fourth, seventh or eighth group, such as copper, aluminium, cerium, tin, titanium, manganese, iron, or their oxides or hydroxides or other compounds, and the substance which absorbs the phosphorus oxide may be compounds of elements of the first and fourth groups or the eighth group, *e.g.*, titanium dioxide, alumina, iron oxide, calcium oxide or silica, *e.g.*, pumice, quartz, fuller's earth, diatomite, or zeolites. Substances such as roasted pyrites containing both catalyst and absorbent may be used.

328,618. OBTAINING HYDROCARBONS OF LOW BOILING POINT FROM CARBONACEOUS MATERIALS. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, October 13, 1928.

Carbonaceous materials liquid at ordinary temperatures are treated with hydrogen or hydrogenating gases at 300°–550° C. at a pressure of 5–200 atmospheres. Catalysts immune from sulphur poisoning may be employed, *e.g.*, elements of the sixth group and elements of groups 2–4. The products are rich in hydrogen, and are then subjected to a cracking treatment with or without hydrogen, nitrogen, carbon monoxide or dioxide. The catalyst may be prepared from oxides of molybdenum, zinc, magnesium, and tungsten, aluminium, thorium, Florida

earth, kaolin, chromic acid, or nickel sulphide. The temperature in the second stage may be raised to 700° C., and a catalyst may be employed such as bauxite, kaolin, Florida earth, bentonite, zinc oxide, manganese dioxide, silica, calcium aluminate, oil shale residues, anhydrous halides of metals and metalloids. An example is given of the treatment of viscous producer tar containing 30 per cent. of a fraction boiling up to 330° C. to obtain a product containing 50–60 per cent. of motor fuel. Reference has been directed by the Comptroller to Specification No. 272,194.

328,620. Mixed Fertilisers. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, October 29, 1928.

Ammonium nitrate, ammonium sulphate, and potassium sulphate or nitrate are treated by methods known for making ammonium sulphate nitrate in order to obtain isomorphous mixed crystals of potassium ammonium sulphate nitrate. Other nitrogenous compounds, phosphates and other salts may be added. In an example, potassium nitrate, ammonium nitrate and ammonium sulphate, are added to a strong solution of ammonium nitrate, to obtain mixed crystals of potassium ammonium sulphate nitrate. Other examples are given, including one containing phosphates.

328,639. Cracking Oils. Midland Coal Products, Ltd., Colwick Estates, Netherfield, Nottingham, and J. E. Truzzell, Brooklands Drive, Gedling, Nottingham. Application date, December 19, 1928.

Heavy oils are mixed with coal and heated under pressure to a temperature such that the oils are vaporised and

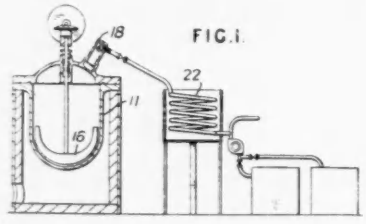


FIG.1.

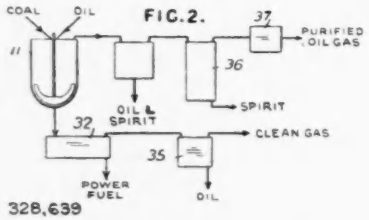


FIG.2.

328,639

cracked without distilling the coal, *e.g.*, a temperature of 200° C., and pressure of 250 atmospheres. In an example, oil is mixed with 40 per cent. of bituminous coal slack and heated to 200° C. in a chamber 11 having a stirrer 16 and loaded valve 18, which prevents the passage of vapour to the condenser 22 until the pressure reaches 150 atmospheres. The valve 18 is opened at a temperature of 200° C. and the remaining vapour allowed to escape, while the residual oil and the coal pass to a rotating cylinder low temperature carbonisation retort where they are destructively distilled to obtain coke, oil, which is collected in a reservoir 35, and gas. The rich gas obtained from the cracking passes through a scrubber 36 and purifier 37, and is then used for illuminating purposes.

328,649. Cracking and Distilling Hydrocarbons. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, February 1, 1929.

Tars, mineral oils, etc. are cracked in the presence of a solid catalyst which maintains its shape under the conditions of working, *e.g.*, bauxite or silica gel. In order to minimise deterioration of the catalyst by deposition of carbonaceous material, some of the liquid with the catalyst is continuously withdrawn and the catalyst separated by distillation, filtration, centrifuging, or extraction with a solvent. The pressure may be 10—100 atmospheres, and other gases, such as hydrogen, nitrogen, water vapour or methane, may be introduced at temperatures between 350° and 650° C. An example is given of the treatment of gas oil with 3·5 per cent. of bauxite, and the subsequent regeneration of the bauxite by combustion of the adherent oil.

328,688. Aluminium Fluoride. A Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, February 5, 1929.

Alumina or hydrated alumina is treated with gaseous hydrofluoric acid from fluor spar and sulphuric acid, or a mixture of gaseous hydrofluoric and hydrochloric acids obtained as described in specification 328,211 (See The Chemical Age, Vol. XXII, p. 612). At 100° C. the water content of the aluminium fluoride is about 6 per cent. decreasing to zero at 200° C. and above.

328,705. Dyes. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, February 13, 1929.

Anthraquinonyl-mercapto-benzanthrones or anthraquinonyl-mercapto-dibenzanthronyls, other than those of such compounds in which an anthraquinone residue is attached by means of a mercapto group to the Bz1- and/or 2-positions in a benzanthrone radical, are treated with alkaline condensing agents, *e.g.*, fused caustic potash. The products dye cotton greenish blue to marine-blue shades. Examples are given of the treatment of 1^1-anthraquinonyl-6-mercapto-benzanthrone, di-α-anthraquinonyl-6 : 6^1-dimercapto-2 : 2^1-dibenzanthronyl, di-α-anthraquinonyl-6:6^1-dimercapto-Bz1:$Bz1^1$-dibenzanthronyl, and di-α-anthraquinonyl-dimercapto-2.$Bz1^1$-dibenzanthronyl.

328,706. Dyeing Processes. Imperial Chemical Industries, Ltd., Millbank, London and R. Brightman, Crumpsall Vale Chemical Works, Blackley, Manchester. Application date, February 13, 1929.

Dsazo dyes obtained by coupling tetrazotised 1:5-diaminonaphthalene with the molecule of a phenol, a naphthol, a carboxylic derivative of a phenol, a naphthol-sulphonic acid or an aminonaphthol-sulphonic, acid and the molecule of another coupling component, excluding 2:5:7-amino-naphthol-sulphonic acid or a derivative either as first or as second component, are used as dyes for regenerated cellulose materials. Examples are given.

328,711. Phosphoric Acid and Hydrogen. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, February 15, 1929.

Phosphorus and water are introduced continuously into a reaction vessel heated to 250°–500° C. at a pressure of 50–300 atmospheres and the reaction products continuously withdrawn. Alternatively, liquid phosphorus may be injected into a column of water heated to 300°-400° C. Phosphoric acid and hydrogen are obtained and the formation of red phosphorus is avoided.

328,719. Destructive Hydrogenation. W. R. Tate and H. P. Stephenson, Norton Hall, The Green, Norton-on-Tees, and Imperial Chemical Industries, Ltd., Millbank, London. Application date, February 21, 1929.

Liquid carbonaceous material to be hydrogenated is preheated by passing through a coil of tubing having an inner concentric tube for the hot liquid products.

328,723. Butanol and Acetone. Deutsche Hydrierwerke Akt.-Ges., 163, Kantstrasse, Charlottenburg, Berlin. International Convention date, October 22, 1928.

Starch, sugar, etc., are fermented, using bacteria of the butylobacter group as inciters of fermentation. Various sources of the bacteria are described, and an application to the treatment of ground maize is given.

Note.—Abstracts of the following specifications, which are now accepted, appeared in The Chemical Age when they became open to inspection under the International Convention : 306,963 (I.G. Farbenindustrie Akt.-Ges.), relating to anthraquinone derivatives, see Vol XX, p. 454 ; 308,666 (I.G. Farbenindustrie Akt.-Ges.), relating to carboxylic acid halides, see Vol. XX, p. 524 ; 314,020 (I.G. Farbenindustrie Akt.-Ges.), relating to β-anthraquinone carboxylic acids and esters, see Vol. XXI, p. 178 ; 316,136 (Victor Chemical Works), relating to crystalline phosphates, see Vol. XXI, p. 294 ; 316,966 (Kali Chemie Akt.-Ges.), relating to barium sulphide, see Vol. XXI, p. 338.

Specifications Accepted with Date of Application

305,674. Readily soluble acyl celluloses yielding clear solutions, Manufacture of. I.G. Farbenindustrie Akt.-Ges. February 9, 1928.

305,947. Soluble esters and ether-esters, Manufacture of. I.G. Farbenindustrie Akt.-Ges. February 11, 1928. (Addition to 283,181 and 297,766.)
306,097. Aliphatic carboxilic acids from aqueous solutions thereof, Manufacture of. I.G. Farbenindustrie Akt.-Ges. February 15, 1928. Addition to 300,923.
307,303. Monoazo dyestuffs, Manufacture of. I.G. Farbenindustrie Akt.-Ges. March 2, 1928.
307,306. Anthraquinone derivatives, Manufacture of. I.G. Farbenindustrie Akt.-Ges. March 3, 1928.
307,436. Lakes or pigments, Manufacture of. I.G. Farbenindustrie Akt.-Ges. March 7, 1928.
307,481. Vat dyestuffs of the anthanthrone series, Manufacture of. I.G. Farbenindustrie Akt.-Ges. March 10, 1928.
307,709. Sulphonation of alcohols of high molecular weight. Deutsche Hydrierwerke Akt.-Ges. March 9, 1928.
307,750. Refining oils and fats by removing free fatty acids therefrom by distillation. Metallges. Akt.-Ges. March 12, 1928.
307,838. Vat dyestuffs of the anthraquinone series, Manufacture of. I.G. Farbenindustrie Akt.-Ges. March 14, 1928.
307,843. Preheating of ammonia gas in the execution of reactions therewith at elevated temperatures. I.G. Farbenindustrie Akt.-Ges. March 14, 1928.
307,881. Oxides of titanium, Production of. J. Blumenfeld. March 15, 1928.
307,937–8. Rubber-like products, Manufacture of. I.G. Farbenindustrie Akt.-Ges. March 16 and 17, 1928.
308,365. δ-alkyl- and δ-aryl-quinolines and their homologues, Manufacture of. I.G. Farbenindustrie Akt.-Ges. March 22, 1928.
308,577. Distillation of tar. Barrett Co. March 23, 1928.
309,024. Catalytic removal of hydrogen or oxygen-containing groups from organic compounds. Selden Co. April 3, 1928.
309,583. Catalytic oxidation of ammonia. Selden Co. April 14, 1928.
312,908. Hydrogen chloride or hydrogen bromide or their corresponding acid solutions, Manufacture of. Rohm and Haas Akt.-Ges. June 2, 1928.
314,858. Contact sulphuric aicd process. Selden Co. July 3, 1928.
330,511. Organic acyl halogenides, Manufacture of. G. B. Ellis. (*Soc. des Usines Chimiques Rhone-Poulenc.*) March 1, 1929.
330,519. Salts of higher homologues of poly-hydroxybenzenes, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) March 6, 1929.
330,520. Rubber, Manufacture of. Soc. Italiana Pirelli, and U. Pestalozza. March 6, 1929. Addition to 284,608.
330,537. Acetic anhydride, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) March 8, 1929.
330,539. Transformation of petroleum hydrocarbons into gasoline. Jenkins Petroleum Process Co. November 16, 1928.
330,565. Refined mineral oils and pure bitumen from crude mineral oils. Process for obtaining. Naamlooze Vennootschap Mijnbouw-en Cultuurmaatschappij Boeton. October 26, 1928.
330,579. Water-soluble leuco esters of vat dyestuffs, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) March 11, 1929. Addition to 324,119.
330,583. Substituted ureas and thioureas, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) January 10, 1929.
330,593. Motor fuels, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) January 9, 1929.
330,602. Dyestuffs, Manufacture of. British Celanese, Ltd., and H. C. Olpin. March 12, 1929.
330,623. Olefines, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) March 11, 1929.
330,643. Hydroxy-carboxylic acids of naphtha-carbazoles, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) March 16, 1929.
330,644. Diaminoazo anthraquinones, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) March 16, 1929.
330,650. Separating magnesium chloride from its aqueous solutions and obtaining anhydrous magnesium chloride. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) February 15, 1929.
330,661. Alumina, Preparation of. W. J. Muller and H. Hiller. March 19, 1929.
330,715. Magnesium oxide from kieserite and other salts or salt mixtures containing magnesium, Production of. Kali-Forschungs-Anstalt Ges. January 12, 1929.
330,723. Working up of the oil-bearing residues from destructive hydrogenation or pressure extraction processes. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) May 10, 1929. Addition to 304,404.
330,777. Acid calcium phosphate, Manufacture of. R. Haddan. (*Federal Phosphorus Co.*) June 20, 1929.
330,791. Electrolysis of fused halogen salts. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) July 1, 1929.
330,862. 3 : 3¹-dichloro-4 : 4¹-dihydroxy-5 : 5¹diacetylamino-arseno-benzene, Manufacture of. I.G. Farbenindustrie Akt.-Ges. October 25, 1928. Addition to 296,327.
330,872. Endothermic catalytic gas reactions, Apparatus for carrying out. I.G. Farbenindustrie Akt. Ges. December 15, 1928.

Applications for Patents

[In the case of applications for patents under the International Convention, the priority date (that is, the original application date abroad which the applicant desires shall be accorded to the patent) is given in brackets, with the name of the country of origin. Specifications of such applications are open to inspection at the Patent Office on the anniversary of the date given in brackets, whether or not they have been accepted.]

Brightman, R. Dyes and dyeing of cellulose materials. 19,632. June 27. (March 5, 1929).
Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of halogen alkyl sulphonic acids, etc. 19,247. June 24.
—— Manufacture of acetic anhydride. 19,248. June 24.
—— Disinfection and destruction of insect pests. 19,249. June 24.
—— Manufacture of stable water-soluble sulphuric acid esters. 19,386. June 25.
—— Manuafcture of vat dyestuff containing sulphur. 19,387. June 25.
—— Manufacture of 2-hydroxycarbazole. 19,482. June 26.
—— Separation of cresols. 19,483. June 26.
Clarke, L. M. Manufacture of sodium sulphide. 19,681. June 28.
Du Pont de Nemours and Co., E. I. and Triggs, W. W. Methods of producing benzanthrone. 19,210. June 24.
Dynamit Akt.-Ges. vorm. Nobel and Co., A. and Johnson, J. Y. Manufacture of monoethanolamine dinitrate. 19,132. June 23.
Frigidaire Corporation. Refrigeration. 19,234. June 24. (United States, February 8).
—— Manufacture of hydrocarbon derivatives. June 24. 19,235. (United States, April 5).
I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Desulphurisation of organic substances. 19,122. June 23.
—— Catalytic hydrogenation of organic compounds. 19,349. June 25.
—— Manufacture of paraffin wax, etc. 19,453. June 26.
—— Manufacture, etc., of lubricating oils. 19,454. June 26.
—— Piston pumps. 19,455. June 26.
—— Manufacture of hydrocarbons. 19,593 June 27.
—— Analysis of gas mixtures containing ethylene oxide. 19,594. June 27.
—— Washing and dyeing wool. 19,595. June 27.
—— Manufacture of vat dyestuffs. 19,713. June 28.
I.G. Farbenindustrie Akt.-Ges. Manufacture of artificial fibres and films from cellulose derivatives. 19,097. June 23. (Germany, July 11, 1929.)
—— Purifying solutions by electrolytic means. 19,463. June 26. (Germany, June 28, 1929.)
—— Spinning viscose. 19,604. June 27. (Germany, August 13, 1929.)
—— Working up beryllium minerals. 19,724. June 28. (Germany, June 28, 1929.)
—— Apparatus for generating acetylene. 19,738. June 28. (Germany, August 1, 1929.)
Imperial Chemical Industries, Ltd. Generation of acetylene. 19,245. June 24.
—— Production of low-boiling hydrocarbons. 19,343. June 25.
—— Traps for throwing clay targets. 19,344. June 25.
—— Manufacture of vulcanised rubber, etc. 19,569. June 27. (United States, June 27, 1929.)
—— Catalytic preparations and their applications. 19,570 June 27. (United States, June 29, 1929.)
—— Devices for firing explosives. 19,571. June 27. (United States, June 27, 1929.)
—— Dyes and dyeing of cellulose materials. 19,632. June 27. (March 5, 1929.)
Imperial Chemical Industries, Ltd. and Spittle, H. M. Manufacture of sodium sulphide. 19,681. June 28.
Imperial Chemical Industries, Ltd., Thomson, R. F., Loveluck, R. J., and Smith, W. Manufacture of N-alkylated amino-halogenanthraquinones. 19,575. June 27.
Kunstharzfabrik, Dr. F. Pollak Ges. Transparent phenol formaldehyde condensation products. 19,728. June 28. (Austria, March 20.)
Laing, B. and Nielsen, H. Distillation of solid carbonaceous materials. 19,718. June 28.
Lodge-Cottrell, Ltd. and Metallges Akt.-Ges. Manufacture of nitric acid. 19,631. June 27.
Naugatuck Chemical Co. Treatment of rubber. 19,126. June 23. (United States, July 2, 1929.)
Neumann, E. Manufacture of higher alcohols, etc. 19,505. June 26.
Newport Co. Vat dyestuffs. 18,638. June 18. (United States, July 1, 1929.)
Urbain, E. Manufacture of phosphoric acid. 18,521. June 17.
—— Recovery of phosphorous and phosphoric acid. 18,522. June 17.
U.S. Industrial Alcohol Co. Solvents, etc. 18,660. June 18. (United States, July 23, 1929.)
Wellacott, W. L. B. Dyes and dyeing of cellulose materials. 19,632. June 27. (March 5, 1929.)

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID, CHROMIC.—1s. 0½d. per lb. d/d U.K.

ACID HYDROCHLORIC.—Spot, 3s. 9d. to 6s. per carboy d/d, according to purity, strength and locality.

ACID NITRIC, 80° TW.—Spot £20 to £25 per ton, makers' works according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA (ANHYDROUS).—Spot, 11d. per lb., d/d in cylinders.

AMMONIUM BICHROMATE.—8d. per lb. d/d U.K.

BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages free.

BLEACHING POWDER, 35/37%.—Spot, £7 10s. per ton d/d station in casks, special terms for contracts.

BORAX, COMMERCIAL.—Crystals, £13 10s. per ton; granulated, £12 10s. per ton; powder, £14 per ton. (Packed in 1 cwt. bags carriage paid any station in Great Britain. Prices quoted are for one ton lots and upwards).

CALCIUM CHLORIDE (SOLID), 70/75%.—Spot, £4 15s. to £5 5s. per ton d/d in drums.

CHROMIUM OXIDE.—9½d. and 10d. per lb. according to quantity d/d U.K.

CHROMETAN.—Crystals, 3½d. per lb. Liquor, £18 15s. per ton d/d U.K.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 7d. to 1s. 11d. per gall. pyridinised industrial, 1s. 9d. to 2s. 1d. per gall.; mineralised 2s. 8d. to 2s. 11d. per gall. 64 O.P., 1d. extra in all cases. Prices according to quantity.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE CRYSTALS AND GRANULAR.—4½d. per lb. nett d/d U.K., discount according to quantity; ground ½d. per lb. extra.

POTASSIUM CHLORATE.—3¾d. per lb., ex-wharf, London, in cwt. kegs.

POTASSIUM CHROMATE.—8d. per lb. d/d U.K.

SALAMMONIAC.—Firsts lump, spot, £42 10s. per ton d/d station in barrels. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE, UNGROUND.—Spot, £3 7s. 6d. per ton d/d station in bulk.

SODA ASH, 58° E.—Spot, £6 per ton, f.o.r. in bags, special terms for contracts.

SODA CAUSTIC, SOLID, 76/77°E.—Spot, £14 10s. per ton, d/d station.

SODA CRYSTALS.—Spot, £5 to £5 5s. per ton, d/d station or ex depot in 2 cwt. bags.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE, REFINED.—Spot, £10 10s. per ton d/d station in bags.

SODIUM BICHROMATE CRYSTALS.—3¾d. per lb. nett d/d U.K., discount according to quantity. Anhydrous ¾d. per lb. extra.

SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton delivered for home market, 1-cwt. drums included; £15 10s. f.o.b. London.

SODIUM CHLORATE.—2¾d. per lb.

SODIUM CHROMATE.—3½d. per lb. d/d U.K.

SODIUM NITRITE.—Spot, £19 per ton, d/d station in drums.

SODIUM PHOSPHATE.—£14 per ton, f.o.b. London, casks free.

SODIUM SILICATE, 140° TW.—Spot, £8 5s. per ton, d/d station returnable drums.

SODIUM SULPHATE (GLAUBER SALTS).—Spot, £4 2s. 6d. per ton, d/d address in bags.

SODIUM SULPHIDE SOLID, 60/62%.—Spot, £10 5s. per ton d/d station in drums. Crystals—Spot, £7 10s. per ton d/d station in returnable casks.

SODIUM SULPHITE, PEA CRYSTALS.—Spot, £13 10s. per ton, d/d station in kegs. Commercial—Spot, £9 per ton, d/d station in bags.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—7d. to 7½d. per lb. Crude 60's, 2s. to 2s. 5d. per gall.

ACID CRESYLIC 99/100.—2s. 2d. to 2s. 6d. per gall. B.P., 5s. per gall. 97/99.—2s. 1d. to 2s. 2d. per gall. Refined, 2s. 7d. to 2s. 10d. per gall. Pale, 95%, 1s. 9d. to 1s. 10d. per gall. 98%, 2s. to 2s. 1d. Dark, 1s. 6d. to 1s. 8d.

ANTHRACENE.—A quality, 2d. to 2½d. per unit. 40%, £4 10s. per ton.

ANTHRACENE OIL, STRAINED, 1080/1090.—4¾d. to 5¼d. per gall. 1100, 5¼d. to 6d. per gall.; 1110, 6d. to 6½d. per gall. Unstrained (Prices only nominal).

BENZOLE.—Prices at works: Crude, 10d. to 11d. per gall.; Standard Motor, 1s. 5d. to 1s. 6d. per gall.; 90%, 1s. 7d. to 1s. 8d. per gall.; Pure, 1s. 10d. to 1s. 11d. per gall.

TOLUOLE.—90%, 1s. 9d. to 1s. 11d. per gall. Pure, 1s. 11d. to 2s. 3d. per gall.

XYLOL.—1s. 5d. to 1s. 10d. per gall. Pure, 1s. 8d. to 2s. 1d. per gall

CREOSOTE.—Cresylic, 20/24%, 6¾d. to 7d. per gall.; Heavy, for Export, 6¼d. to 6¾d. per gall. Home, 4d. per gall. d/d. Middle oil, 4½d. to 5d. per gall. Standard specification, 3d. to 4d. per gall. Light gravity, 1½d. to 1¾d. per gall. ex works. Salty, 7½d. per gall.

NAPHTHA.—Crude, 8¼d. to 8¾d. per gall. Solvent, 90/160, 1s. 3d. to 1s. 3½d. per gall. Solvent, 95/160, 1s. 4d. to 1s. 6d. per gall. Solvent 90/190, 1s. to 1s. 2½d. per gall.

NAPHTHALENE, CRUDE.—Drained Creosote Salts, £4 10s. to £5 per ton. Whizzed, £4 10s. per ton. Hot pressed, £8 per ton.

NAPHTHALENE.—Crystals, £12 5s. per ton. Purified Crystals, £14 10s. per ton. Flaked, £14 to £15 per ton.

PITCH.—Medium soft, 46s. to 47s. 6d. per ton, f.o.b., according to district. Nominal.

PYRIDINE.—90/140, 3s. 9d. to 4s. per gall. 90/160, 3s. 6d. to 3s. 9d. per gall. 90/180, 1s. 9d. to 2s. 3d. per gall. Heavy prices only nominal.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—6s. per lb. 100%.

ACID GAMMA.—Spot, 3s. 9d. per lb. 100% d/d buyer's works.

ACID H.—Spot, 2s. 3d. per lb. 100% d/d buyer's works.

ACID NAPHTHIONIC.—1s. 5d. per lb. 100% d/d buyer's works.

ACID NEVILLE AND WINTHER.—Spot, 2s. 7d. per lb. 100% d/d buyer's works.

ACID SULPHANILIC.—Spot, 8½d. per lb. 100% d/d buyer's works.

ANILINE OIL.—Spot, 8½d. per lb., drums extra, d/d buyer's works.

ANILINE SALTS.—Spot, 8½d. per lb. d/d buyer's works.

BENZALDEHYDE.—Spot, 1s. 8d. per lb., packages extra, d/d buyer's works.

BENZIDINE BASE.—Spot, 2s. 6d. per lb. 100% d/d buyer's works.

BENZOIC ACID.—Spot, 1s. 8½d. per lb. d/d buyer's works.

o-CRESOL 30/31° C.—£3 1s. 10d. per cwt., in 1 ton lots.

m-CRESOL 98/100%.—2s. 9d. per lb., in ton lots.

p-CRESOL 34·5° C.—1s. 9½d. per lb., in ton lots.

DICHLORANILINE.—1s. 10d. per lb. f.o.r. works.

DIMETHYLANILINE.—Spot, 1s. 9½d. per lb., drums extra d/d buyer's works.

DINITROBENZENE.—8d. per lb.

DINITROCHLORBENZENE.—£74 per ton d/d.

DINITROTOLUENE.—48/50° C., 7½d. per lb.; 66/68° C., 9d. per lb. f.o.r. works.

DIPHENYLAMINE.—Spot, 1s. 8d. per lb. d/d buyer's works.

a-NAPHTHOL.—Spot, 1s. 11d. per lb. d/d buyer's works.

B-NAPHTHOL.—Spot, £65 per ton in 1 ton lots, d/d buyer's works.

a-NAPHTHYLAMINE.—Spot, 1s. per lb. d/d buyer's works.

B-NAPHTHYLAMINE.—Spot, 2s. 9d. per lb. d/d buyer's works.

o-NITRANILINE.—5s. 11d. per lb.

m-NITRANILINE.—Spot, 2s. 6d. per lb. d/d buyer's works.

p-NITRANILINE.—Spot, 1s. 8d. per lb. d/d buyer's works.

NITROBENZENE.—Spot, 6½d. per lb, 5-cwt. lots, drums extra, d/d buyer's works.

NITRONAPHTHALENE.—9d. per lb.

R. SALT.—Spot, 2s. per lb. 100% d/d buyer's works.

SODIUM NAPHTHIONATE.—Spot, 1s. 6½d. per lb. 100% d/d buyer's works.

o-TOLUIDINE.—Spot, 8d. per lb., drums extra, d/d buyer's works.

p-TOLUIDINE.—Spot, 1s. 9d. per lb. d/d buyer's works.

m-XYLIDINE ACETATE.—3s. 1d. per lb. ex works.

Wood Distillation Products

ACETATE OF LIME.—Brown, £9 15s. to £10 5s. per ton. Grey, £16 10s. to £17 10s. per ton. Liquor, 9d. per gall.

ACETONE.—£78 per ton.

CHARCOAL.—£6 to £8 10s. per ton, according to grade and locality.

IRON LIQUOR.—1s. 3d. per gall. 32° Tw. 1s. per gall. 24° Tw.

WOOD CREOSOTE.—1s. 9d. per gall., unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. 8d. to 3s. 11d per gall. Solvent, 4s. to 4s. 3d. per gall.

WOOD TAR.—£3 10s. to £4 10s. per ton

BROWN SUGAR OF LEAD.—£38 per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6½d. to 1s. 3d. per lb. according to quality; Crimson, 1s. 3d. to 1s. 5d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—1s. 8d. to 1s. 10d. per lb.

BARYTES.—£5 10s. to £7 per ton, according to quality.

CADMIUM SULPHIDE.—5s. to 6s. per lb.

CARBON BISULPHIDE.—£26 to £28 per ton, according to quantity; drums extra.

CARBON BLACK.—4 1/16d. to 4½d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£40 to £50 per ton, according to quantity, drums extra.

CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.
DIPHENYLGUANIDINE.—2s. 9d. per lb.
LITHOPONE, 30%.—£20 to £22 per ton.
SULPHUR.—£9 10s. to £13 per ton, according to quality.
SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra.
SULPHUR PRECIP. B.P.—£55 to £60 per ton, according to quantity.
ZINC SULPHIDE.—8d. to 11d. per lb

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£37 per ton, ex wharf London, barrels free.
ACID, ACETYL SALICYLIC.—2s. 9d. to 2s. 11d. per lb., according to quantity.
ACID, BENZOIC B.P.—2s. to 2s. 3d. per lb., for synthetic product, according to quantity. Solely ex Gum, 1s. 6d. per oz.; 50-oz. lots, 1s. 3d. per oz.
ACID, BORIC B.P.—Crystal, £31 per ton; powder, £32 per ton; For one ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.
ACID, CAMPHORIC.—19s. to 21s. per lb.
ACID, CITRIC.—1s. 6d. to 1s. 6¾d. per lb., less 5%.
ACID, GALLIC.—2s. 11d. per lb. for pure crystal, in cwt. lots.
ACID, MOLYBDIC.—5s. 3d. per lb. in ¼ cwt. lots. Packages extra. Special prices for quantities and contracts.
ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d.
ACID, SALICYLIC, B.P. PULV.—1s. 5d. to 1s. 8d. per lb. Technical.—1s. to 1s. 2d. per lb.
ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.
ACID, TARTARIC.—1s. 1½d. per lb., less 5%.
ACETANILIDE.—1s. 5d. to 1s. 8d. per lb. for quantities.
AMIDOL.—7s. 6d. to 9s. per lb., d/d.
AMIDOPYRIN.—7s. 9d. to 8s. per lb.
AMMONIUM BENZOATE.—3s. 3d. to 3s. 9d. per lb., according to quantity. 18s. per lb. ex Gum.
AMMONIUM CARBONATE B.P.—£36 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimated, 1s. per lb.
AMMONIUM MOLYBDATE.—4s. 9d. per lb. in ¼ cwt. lots. Packages extra. Special prices for quantities and contracts.
ATROPHINE SULPHATE.—9s. per oz.
BARBITONE.—5s. 9d. to 6s. per lb.
BENZONAPHTHOL.—3s. to 3s. 3d. per lb.
BISMUTH CARBONATE.—6s. 6d. per lb.
BISMUTH CITRATE.—6s. 9d. per lb.
BISMUTH SALICYLATE.—6s. 7d. per lb.
BISMUTH SUBNITRATE.—5s. 6d. per lb.
BISMUTH NITRATE.—Cryst. 4s. 4d. per lb.
BISMUTH OXIDE.—8s. 6d. per lb.
BISMUTH SUBCHLORIDE.—8s. per lb.
BISMUTH SUBGALLATE.—6s. 9d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.
BISMUTHI ET AMMON LIQUOR.—Cit. B.P. in W. Qts. 1s. 0½d. per lb.; 12 W. Qts. 11½d. per lb.; 36 W. Qts. 11d. per lb.
BORAX B.P.—Crystal, £21 10s. per ton; powder, £22 per ton; For one ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.
BROMIDES.—Ammonium, 1s. 9d. per lb.; potassium, 1s. 5½d. per lb.; granular, 1s. 5d. per lb.; sodium, 1s. 8d. per lb. Prices for 1 cwt. lots.
CALCIUM LACTATE.—B.P., 1s. 1½d. to 1s. 3d. per lb., in 1-cwt. lots.
CAMPHOR.—Refined flowers, 3s. to 3s. 2d. per lb., according to quantity; also special contract prices.
CHLORAL HYDRATE.—3s. 1d. to 3s. 4d. per lb.
CHLOROFORM.—2s. 4½d. to 2s. 7½d. per lb., according to quantity.
CREOSOTE CARBONATE.—6s. per lb.
ETHERS.—S.G. ·730—1s. to 1s. 1d. per lb., according to quantity; other gravities at proportionate prices.
FORMALDEHYDE, 40%.—37s. per cwt., in barrels, ex wharf.
GUAIACOL CARBONATE.—4s. 6d. to 4s. 9d. per lb.
HEXAMINE.—2s. 3d. to 2s. 6d. per lb.
HOMATROPINE HYDROBROMIDE.—30s. per oz.
HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.
HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 3s. per gall.
HYDROQUINONE.—3s. 9d. to 4s. per lb., in cwt. lots.
HYPOPHOSPHITES.—Calcium, 2s. 5d. per lb.; potassium, 2s. 8½d. per lb.; sodium, 2s. 7½d. per lb., in 1 cwt. lots, assorted.
IRON AMMONIUM CITRATE.—B.P., 2s. 5d. per lb. for 28 lb. lots. Green, 3s. 1d. per lb., list price. U.S.P., 2s. 4d. to 2s. 7d. per lb.
IRON PERCHLORIDE.—18s. to 20s. per cwt., according to quantity.
IRON QUININE CITRATE.—B.P., 8½d. to 8¾d. per oz., according to quantity.
MAGNESIUM CARBONATE.—Light commercial, £31 per ton net.
MAGNESIUM OXIDE.—Light commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb.
MENTHOL.—A.B.R. recrystallised B.P., 17s. per lb. net; Synthetic, 9s. 6d. to 11s. per lb.; Synthetic detached crystals, 9s. 6d. to 11s. per lb., according to quantity; Liquid (95%), 9s. per lb.
MERCURIALS B.P.—Up to 1 cwt. lots, Red Oxide, crystals, 8s. 4d to 8s. 5d. per lb., levig., 7s. 10d. to 7s. 11d. per lb.; Corrosive Sublimate, Lump, 6s. 7d. to 6s. 8d. per lb., Powder, 6s. to 6s. 1d. per lb.; White Precipitate, Lump, 6s. 9d. to 6s. 10d. per lb., Powder, 6s. 10d. to 6s. 11d. per lb., Extra Fine, 6s. 11d. to 7s. per lb.; Calomel, 7s. 2d. to 7s. 3d. per lb.; Yellow Oxide, 7s. 8d. to 7s. 9d. per lb.; Persulph, B.P.C., 6s. 11d. to 7s. per lb.; Sulph. nig., 6s. 8d. to 6s. 9d. per lb. Special prices for larger quantities.
METHYL SALICYLATE.—1s. 3d. to 1s. 5d. per lb
METHYL SULPHONAL.—18s. 6d. to 20s. per lb.
METOL.—9s. to 11s. 6d. per lb. British make.
PARAFORMALDEHYDE.—1s 9d. per lb. for 100% powder.
PARALDEHYDE.—1s. 4d. per lb.
PHENACETIN.—3s. 9d. to 4s. 1d. per lb.
PHENAZONE.—5s. 6d. per lb.
PHENOLPHTHALEIN.—5s. 11d. to 6s. 1½d. per lb.
POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—92s. 6d. per cwt., less 2½ per cent.
POTASSIUM CITRATE.—B.P.C., 2s. 3d. per lb. in 28 lb. lots. Smaller quantities 1d. per lb. more.
POTASSIUM FERRICYANIDE.—1s. 7½d. per lb., in 125 lb. kegs
POTASSIUM IODIDE.—16s. 8d. to 17s. 2d. per lb., according to quantity.
POTASSIUM METABISULPHITE.—6d. per lb., 1-cwt. kegs included f.o.r. London.
POTASSIUM PERMANGANATE.—B.P. crystals, 5½d per lb., spot.
QUININE SULPHATE.—1s. 8d. to 1s. 9d. per oz., bulk in 100 oz. tins
RESORCIN.—2s. 10d. to 3s. per lb., spot.
SACCHARIN.—43s. 6d. per lb.
SODIUM BENZOATE B.P.—1s. 9d. per lb. for 1-cwt. lots.
SODIUM CITRATE, B.P.C., 1911, AND U.S.P. VIII.—1s. 11d. per lb., B.P.C. 1923, and U.S.P. IX—2s. 3d. per lb. Prices for 28 lb. lots. Smaller quantities 1d. per lb. more.
SODIUM FERROCYANIDE.—4d. per lb., carriage paid.
SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 per ton, d/d consignee's station in 1-cwt. kegs.
SODIUM NITROPRUSSIDE.—16s. per lb.
SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—95s. to 100s. per cwt. net. Crystals, 2s. 6d. per cwt. extra.
SODIUM SALICYLATE.—Powder, 1s. 10d. to 2s. 2d. per lb. Crystal, 1s. 11d. to 2s. 3d. per lb.
SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 2d. per lb.
SODIUM SULPHITE, ANHYDROUS.—£27 10s. to £29 10s. per ton, according to quantity. Delivered U.K.
SULPHONAL.—9s. 6d. to 10s. per lb.
TARTAR EMETIC, B.P.—Crystal or powder, 1s. 9d. to 2s. per lb.
THYMOL.—Puriss, 8s. 3½d. to 9s. 2d. per lb., according to quantity. Natural, 12s. per lb.

Perfumery Chemicals

ACETOPHENONE.—7s. per lb.
AUBEPINE (EX ANETHOL).—12s. per lb.
AMYL ACETATE.—2s. 6d. per lb.
AMYL BUTYRATE.—5s. per lb.
AMYL CINNAMIC ALDEHYDE.—11s. per lb.
AMYL SALICYLATE.—3s. per lb.
ANETHOL (M.P. 21/22° C.).—8s. per lb.
BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.
BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—2s. per lb
BENZYL ALCOHOL FREE FROM CHLORINE.—2s. per lb.
BENZYL BENZOATE.—2s. 6d. per lb.
CINNAMIC ALDEHYDE NATURAL.—13s. 3d. per lb.
COUMARIN.—12s. per lb.
CITRONELLOL.—10s. per lb.
CITRAL.—8s. per lb.
ETHYL CINNAMATE.—6s. 6d. per lb.
ETHYL PHTHALATE.—2s. 9d. per lb.
EUGENOL.—9s. 6d. per lb.
GERANIOL (PALMAROSA).—18s. per lb.
GERANIOL.—7s. 6d. to 10s. per lb.
HELIOTROPINE.—6s. 6d. per lb.
ISO EUGENOL.—11s. 9d. per lb.
PHENYL ETHYL ACETATE.—11s. per lb.
PHENYL ETHYL ALCOHOL.—9s. per lb.
RHODINOL.—46s. per lb.
SAFROL.—2s. per lb.
TERPINEOL.—1s. 6d. per lb.
VANILLIN, EX CLOVE OIL.—13s. 6d. to 15s. per lb. Ex Guaiacol, 12s. 6d. to 13s. 9d. per lb.

Essential Oils

ALMOND OIL.—Foreign S.P.A., 10s. per lb.
ANISE OIL.—5s. per lb.
BERGAMOT OIL.—10s. 6d. per lb.
BOURBON GERANIUM OIL.—20s. per lb.
CAMPHOR.—White, 2s. per lb.
CANANGA.—Java, 9s. 9d. per lb.
CASSIA OIL, 80/85%.—4s. 9d. per lb.
CINNAMON OIL LEAF.—6s. 9d. per oz.
CITRONELLA OIL.—Java, 2s. 7d. per lb., c.i.f. U.K. port.
LAVENDER.—Mont Blanc, 38 to 40%, 11s. per lb.
PALMA ROSA.—10s. 9d. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.*

London, July 3, 1930.

THE market has been somewhat brighter during the past week, the demand having been better than for some time, whilst the amount of actual business booked has also been of larger volume. Prices in the main are steady.

General Chemicals

ACETONE.—There has been a steady flow of orders with the market firm at £71 10s. to £80 per ton, according to quantity.

ACETIC ACID.—Continues in steady request with technical 80% quoted at £36 10s. and 80% edible at £37 10s. per ton.

ACID CITRIC has been in a little better demand and price is now steady at about 1s. 6½d. to 1s. 7d. per lb., less 5%.

ACID LACTIC.—In better demand with the market firm at £42 per ton for 50% by weight pale quality.

ACID OXALIC.—The market is firm at £30 7s. 6d. to £32 per ton, according to quantity, and continues in very good request.

SULPHATE OF ALUMINA is quoted at £8 to £8 15s. per ton for the 17/18% iron free quality, and there is a brisk trade passing.

ARSENIC is still rather inactive, but prices are now steady at £15 15s. per ton, free on rails at the mines.

CREAM OF TARTAR.—There has been an increased demand especially on export account and price is steady at 93s. to 94s. per cwt., ex wharf London.

COPPER SULPHATE.—Conditions in this section are fair with regular quantities moving. Price is unchanged at £21 10s. to £22 per ton free on rails.

FORMALDEHYDE continues in good demand, with price steady at about £33 per ton.

LEAD ACETATE.—In fair demand, with price a little easier at £40 per ton, for white and £39 per ton for brown.

LEAD NITRATE.—In quiet request at £30 to £32 per ton according to quantity.

LITHOPONE.—There is a steady trade passing at £19 15s. to £23 per ton, according to grade.

CARBONATE OF POTASH is in good request at £27 per ton for 96/98% arsenic free quality.

PERMANGANATE OF POTASH continues in good demand at 5½d. per lb. for the B.P. quality.

SODIUM BICHROMATE.—The market is now steady at the reduced price of 3⅜d., and there is a regular demand.

SODA HYPOSULPHITE.—Commercial crystals are in steady request at £8 10s. per ton, with photographic crystals in strong demand at about £14 15s. per ton.

SODIUM SULPHIDE.—Steady in price and in good demand.

TARTAR EMETIC.—Unchanged at about 11d. per lb.

ZINC SULPHATE is unchanged at about £12 10s. per ton with a little better demand.

Coal Tar Products

There is no important change to report in the market for coal tar products since last week. The market remains steady, and prices still have a tendency to a higher level, owing to the shortage of supplies.

MOTOR BENZOL remains firm at about 1s. 5½d. to 1s. 6½d. per gallon f.o.r.

SOLVENT NAPHTHA is firm at about 1s. 2½d. to 1s. 3d. per gallon f.o.r.

HEAVY NAPHTHA is unchanged at about 1s. 1d. per gallon f.o.r.

CREOSOTE OIL remains unchanged at 3d. to 3½d. per gallon fo.r. in the North, and at 4d. to 4½d. per gallon in London.

CRESYLIC ACID is quoted at 2s. per gallon for the 98/100% quality, and at 1s. 10d. per gallon ex works for the dark quality 95/97%.

NAPHTHALENES.—The firelighter quality is quoted at £3 10s. to £3 15s. per ton, the 74/76 quality at £4 to £4 5s. per ton, and the 76/78 quality at about £5 per ton.

PITCH remains at a nominal price of 40s. to 45s. per ton, f.o.b. East Coast Port.

Nitrogen Fertilisers

Sulphate of Ammonia.—Export.—Now that the consuming season is over and new prices have not been announced for the year 1930/31, there is very little business for sulphate of ammonia. The price usually quoted is £7 7s. 6d. per ton, f.o.b. U.K. port in single bags, basis 20·6 per cent. nitrogen.

Home.—In the home market small quantities are still being purchased for immediate consumption, but no large business will be done until the new season's prices are announced.

Sulphate and Nitrate Selling Prices

IMPERIAL Chemical Industries, Ltd., announce that the home prices and conditions of sale for sulphate of ammonia during July will be exactly the same as those for February–June.

The Chilean Nitrate Committee announce that the selling prices and conditions of sale for Chilean nitrate of soda in Great Britain and Ireland for July 1–31, 1930, will be the same as those ruling for June, 1930. The scheme of price protection has also been extended until July 31, 1930.

Latest Oil Prices

LONDON, July 2.—LINSEED OIL was steady. Spot, ex mill, £41 10s.; July, £37 10s.; July-August, £37; September-December, £35 5s.; January-April, £32 2s. 6d., naked. RAPE OIL was inactive. Crude extracted, £35; technical refined, £36 10s., naked, ex wharf. COTTON OIL was steady. Egyptian crude, £27; refined common edible, £32; deodorised, £34, naked, ex mill. TURPENTINE was dull and 3d. to 6d. per cwt. lower. American spot and August, 38s.; September-December, 38s. 3d.; Russian, spot, 35s. 7½d.

HULL.—LINSEED OIL.—Spot, £39 15s.; July, £38 10s.; July-August, £38 15s.; September-December, £36 2s. 6d. per ton, naked. COTTON OIL.—Egptian crude, spot, £26 15s.; edible refined, spot, £30; technical, spot, £29 10s.; deodorised, spot, £32 per ton, naked. PALM KERNEL OIL.—Crude, 5½ per cent., spot, £28 per ton, naked. GROUNDNUT OIL.—Crushed/extracted, spot, £31; deodorised, spot, £35 per ton. SOYA OIL.—Crushed/extracted, spot, £28 5s.; deodorised, spot, £31 15s. per ton. RAPE OIL.—Crushed/extracted, spot, £32 10s.; refined, spot, £34 10s. per ton. TURPENTINE, CASTOR OIL and COD OIL unchanged.

South Wales By-Products

THERE is no change in South Wales by-product activities. Most products are quiet, but values generally are unchanged. Pitch has only a small call, but prices remain firm, despite heavy stocks on hand. Road tar is in moderate request at from 10s. 6d. to 12s. 6d. per 40-gallon barrel at makers' works. Motor benzol has a fair call round about 1s. 4½d. per gallon, while solvent naptha is also in fairly good demand. Heavy naphtha and sulphate of ammonia have practically no demand, but prices are unchanged. Refined tars continue to have a steady, if moderate call, with values for coke-oven and gasworks tar unchanged. Patent fuel and coke exports are slow. Patent fuel prices for export are:—22s., ex-ship Cardiff; 20s. to 21s., ex-ship Swansea and Newport. Coke prices are: Best foundry, 36s. to 37s.; good foundry, 27s. 6d. to 32s. 6d.; furnace, 21s. to 21s. 6d. Oil imports into Swansea during the four weeks' period ending June 24 amounted to 21,780,865 gallons.

By-Products of German Potash Industry

RECEIPTS from sales of by-products of the German potash industry such as rock salt, bromine, magnesium chloride, Epsom salts, etc., in 1929, totalled 34,000,000 marks, divided among the several concerns as follows: Wintershall, 10,000,000 marks; Burbach, 6,500,000 marks; Ashersleben, 4,000,000 marks; Westergeln, 4,000,000 marks; Salzdetfurth, 2,000,000 marks; other companies, 7,500,000 marks.

German production of potash by-products in 1929 included 125,000 tons of magnesium chloride, both solid and liquid, and 1,800 tons of bromine. Sodium sulphate of salt cake production in 1929 was not reported, but the rate of production in previous years has been between 280,000 and 300,000 tons. Export in 1928 and 1929 of these three products, as well as magnesium sulphate and salt, are shown as follows:

	1928	1929	
	Metric tons.	Metric tons.	Marks.
Bromine	184	233	727,000
Magnesium Chloride ..	36,585	42,999	3,612,000
Sodium sulphate	120,393	177,373	8,924,000
Magnesium sulphate ..	93,942	100,869	4,385,000
Salt (1)	880,092	969,815	17,379,000

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing this firm's independent and impartial opinions.*

Glasgow, July 1, 1930.

THERE is a disappointing falling off in inquiries for home and export in the Scottish heavy chemical market. Prices generally remain steady.

Industrial Chemicals

ACETONE B.G.S.—£71 10s. to £80 per ton, ex wharf, according to quantity. Inquiries remain satisfactory.

ACID ACETIC.—Prices ruling are as follows:—Glacial 98/100%, £53 to £64 per ton; pure, £37 10s. per ton; technical 80%, £37 10s. per ton, ex wharf.

ACID BORIC.—Granulated, £22 per ton; crystals, £23 per ton; powder, £24 per ton, packed in 1 cwt. bags free, delivered Great Britain in 1 ton lots and upwards.

ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. per carboy. Dearsenicated quality, 5s. 6d. per carboy, ex works, full wagon loads.

ACID NITRIC 80° quality.—£24 10s. per ton, ex station, full truck loads.

ACID OXALIC 98/100%.—On offer at the same price, viz., 3¼d. per lb., ex store. Offered from the Continent at 3⅛d. per lb., ex wharf.

ACID SULPHURIC.—£3 2s. 6d. per ton, ex works, for 144° quality; £5 15s. per ton for 168°. Dearsenicated quality, 20s. per ton extra.

ACID TARTARIC B.P. CRYSTALS.—Quoted 1s. 4d. per lb., less 5% ex wharf. On offer for prompt delivery from the Continent at 1s. 4⅛d. per lb., less 5% ex wharf.

ALUMINA SULPHATE.—Quoted at round about £8 15s. per ton, ex store.

ALUM, LUMP POTASH.—Now quoted £8 7s. 6d. per ton, c.i.f. U.K. ports. Crystal meal, about 2s. 6d. per ton less.

AMMONIA ANHYDROUS.—Quoted 10¼d. per lb., containers extra and returnable.

AMMONIA CARBONATE.—Lump quality quoted £36 per ton; powdered, £38 per ton, packed in 5 cwt. casks, delivered U.K. stations or f.o.b. U.K. ports.

AMMONIA LIQUID 80°.—Unchanged at about 2½d. to 3d. per lb., delivered, according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £21 to £22 per ton, ex station. Fine white crystals offered from the Continent at about £17 5s. per ton, c.i.f. U.K. ports.

ANTIMONY OXIDE.—Rather easier, and spot material now obtainable at round about £30 per ton, ex wharf. On offer for shipment from China at about £27 per ton, c.i.f. U.K. ports.

ARSENIC, WHITE POWDERED.—Quoted £18 per ton, ex wharf, prompt shipment from mines. Spot material still on offer at £19 15s. per ton, ex store.

BARIUM CHLORIDE.—In good demand and price about £11 per ton, c.i.f. U.K. ports. For Continental material our price would be £10 per ton, f.o.b. Antwerp or Rotterdam.

BLEACHING POWDER.—British manufacturers' contract price to consumers unchanged at £6 12s. 6d. per ton, delivered in minimum 4 ton lots. Continental now offered at about the same figure.

CALCIUM CHLORIDE.—Remains unchanged. British manufacturers' price, £4 15s. per ton to £5 5s. per ton, according to quantity and point of delivery. Continental material on offer at £3 12s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS GREEN.—Unchanged at about £3 10s. per ton, f.o.r. works or £4 12s. 6d. per ton, f.o.b. U.K. ports.

FORMALDEHYDE 40%.—Now quoted £33 10s. per ton, ex store. Continental material now on offer at about £34 per ton, ex wharf.

GLAUBER SALTS.—English material quoted £4 10s. per ton, ex station. Continental on offer at about £3 per ton, ex wharf.

LEAD, RED.—Price now £34 10s. per ton, delivered buyers' works.

LEAD, WHITE.—Quoted £53 10s. per ton, c.i.f. U.K. ports.

LEAD, ACETATE.—White crystals quoted round about £39 to £40 per ton, ex wharf. Brown on offer at about £2 per ton less.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store. In moderate demand.

METHYLATED SPIRIT.—Industrial quality, 64 O.P., quoted 1s. 8d. per gallon, less 2½% delivered.

POTASSIUM BICHROMATE.—Quoted 4⅛d. per lb., delivered U.K. or c.i.f. Irish ports, with an allowance for contracts.

POTASSIUM CARBONATE.—Spot material on offer at £26 10s. per ton, ex store, offered from the Continent at £25 5s. per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE, 99¾/100% POWDER.—Quoted £25 10s. per ton, ex wharf. Crystals, 30s. per ton extra.

POTASSIUM NITRATE.—Refined granulated quality quoted £19 2s. 6d. per ton, c.i.f. U.K. ports. Spot material on offer at about £20 10s. per ton, ex store.

POTASSIUM PERMANGANATE B.P. CRYSTALS.—Quoted 5¼d. per lb., ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—Spot material quoted 7d. per lb., ex store. Offered for prompt delivery from the Continent at about 6¾d. per lb., ex wharf.

SODA, CAUSTIC.—Powdered 98/99%, £17 10s. per ton, in drums, £18 15s. per ton in casks. Solid 76/77% £14 10s. per ton in drums, £14 12s. 6d. per ton for 70/72% in drums, all carriage paid buyers' station. Minimum 4-ton lots. For contracts 10s. per ton less.

SODIUM BICARBONATE.—Refined recrystallised £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3⅞d. per lb. delivered buyers premises, with concession for contracts.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station. Powdered or pea quality 27s. 6d. per ton extra. Light soda ash £7 13s. per ton, ex quay, minimum 4-ton lots, with various reductions for contracts.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £8 17s. 6d. per ton, ex station, minimum 4-ton lots. Pea crystals on offer at £14 15s. per ton, ex station, minimum 4-ton lots. Prices for this year unchanged.

SODIUM NITRATES.—Chilean producers now offer at £10 2s. per ton, carriage paid buyers' sidings, minimum 6-ton lots, but demand in the meantime is small.

SODIUM PRUSSIATE.—Quoted 5¼d. per lb., ex store. On offer at 5d. per lb., ex wharf, to come forward.

SODIUM SULPHATE (SALTCAKE).—Prices 55s. per ton, ex works, 57s. 6d. per ton delivered, for unground quality. Ground quality 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Price for home consumption: solid 61/62%, £9 15s.; broken 60/62%, £10 15s. per ton. Crystals 30/32%, £7 17s. 6d. per ton, all delivered buyers' works on contract minimum 4-ton lots. Special prices for some consumers. Spot material, 5s. per ton extra.

SULPHUR.—Flowers, £12 per ton; Roll, £10 10s. per ton; rock, £9 5s. per ton; ground American, £9 5s. per ton, ex store.

ZINC CHLORIDE 98%.—British material offered at round about £20 per ton f.o.b. U.K. ports.

ZINC SULPHATE.—Quoted £10 per ton, ex wharf.

NOTE.—Please note that the above prices are for bulk business and are not to be taken as applicable to small pracels.

A Link with Burns

MR. JOHN TENNANT, associated with the firm of Chas. Tennant and Co., of St. Rollox Chemical Works, Glasgow, and for several years manager of the Carnoustie branch, whose death at the age of 91 was briefly announced last week, was very proud of the intimate relations between his family and the Scottish national poet, Burns. Mr. Tennant was a son of the late Mr. John Tennant, farmer, Glenconner, Ochiltree, and it was to one of his forebears, Mr. James Tennant of Ochiltree Mill, that Burns addressed the epistle beginning:

> "Auld comrade dear and brither sinner,
> How's a' the folk about Glenconner?"

A man of literary tastes and gifts, the late Mr. Tennant was an enthusiastic admirer of Burns. He compiled a history of the Tennant family, and in recent years read the proofs for Mr. D. A. Wilson of his *Life of Carlyle*.

Marking of Imported Scientific Glassware

A SUPPLEMENTARY Government Notice (reprinted in the *Board of Trade Journal* of June 26) has been issued under the Merchandise Marks Act, 1926, setting out that class of imported goods which are required to bear an indication of origin and how and where they are to be marked. Over 200 types of scientific glassware are listed, the majority being required as from March 17, 1930, to have the indication of origin applied to each article by acid-stamping or etching, sand-blasting, engraving or burnt-on enamel. Test tubes and tubing and rod may have the stamp either on each article or the container in which they are imported, exposed for sale or sold, but thermometer blanks and blanks for volumetric measures must each be stamped.

Manchester Chemical Market

[From Our Own Correspondent.]

Manchester, July 3, 1930.

In respect of the majority of lines of chemical products, the demand this week on the local market has been by no means active, and although, considering the state of many of the consuming industries there is a fair flow of delivery specifications, the quantities going into consumption are much below normal. For the most part, new business that has been placed during the past week has been in connection with relatively small parcels, and judging from the lightness of the inquiry that is in circulation at the present time there is little prospect of buying operations showing any marked early improvement.

Heavy Chemicals

A quiet trade is passing in the case of phosphate of soda, current quotations for which are up to £11 10s. per ton for the dibasic quality. Although perhaps without quotable chang on the week, chlorate of soda at about £24 15s. per ton seems to be rather steadier in tone; the demand, however, in this section is still on a very moderate scale. Prussiate of soda is well held at from 4¾d. to 5¼d. per lb., according to quantity, although no big weight of business is going through in this section at the present time. There is a quietly steady demand for alkali, offers of which are maintained at about £6 per ton, with bicarbonate of soda in moderate request at £10 10s. per ton. Caustic soda continues to be quoted on a contract basis of £12 15s. to £14 per ton, according to quality, a fair business being reported. Bichromate of soda meets with some inquiry, with quotations on the basis of 3⅜d. per lb., less 1 to 3½ per cent. The demand for sulphide of sodium is on quiet lines, but at about £10 per ton for the 60–65 per cent. concentrated solid quality and £8 for the commercial values are pretty much as before. Hyposulphite of soda is in moderate request at about £15 5s. per ton for the photographic grade and £9 for the commercial. Offers of saltcake range from about £2 15s. to £3 per ton, but the demand for this material is rather slow.

There is a quiet call for yellow prussiate of potash, values of which keep steady at from 6¾d. to 7¼d. per lb., according to quantity. Caustic potash is not too strong and down to £29 per ton has been mentioned here during the past week. Moderate sales of carbonate of potash are being made, with current quotations in the neighbourhood of £25 per ton. Permanganate of potash is moving in small quantities, but prices keep up at about 5¼d. per lb. for the commercial kind and round 5½d. for the B.P. Chlorate of potash is attracting limited attention, with values at about £26 per ton. With regard to bichromate of potash a moderate business is reported on the basis of 4½d. per lb., less 1 to 3½ per cent.

Only a relatively small trade is passing in the case of sulphate of copper and at round £23 10s. per ton, f.o.b., lower values are being indicated for this material. Arsenic maintains its renewed steadiness at about £16 per ton at the mines for white powdered, Cornish makes, although the demand this week has been on the quiet side. Acetate of lime prices seem to be rather easy in tendency at about £7 10s. per ton for the brown material and £14 10s. for the grey. There has been little quotable change in the position of the lead products; the acetates are on offer at round £37 per ton for the white and £36 for the brown, with nitrate selling in limited quantities at about £29 per ton.

Acids and Tar Products

Acetic acid keeps firm at round £36 per ton for the commercial 80 per cent. quality and £66 for the glacial, and a fair amount of business is being put through. Oxalic acid is in quiet demand with offers maintained at about £1 12s. per cwt., ex store. Citric acid continues to lack strength and values are down to from 1s. 6¼d. to 1s. 6½d. per lb., with tartaric at about 1s. 1¼d. per lb., buying interest in both cases being rather restricted.

Pitch is a quiet section of the by-products market at about 47s. 6d. per ton, f.o.b., with creosote oil also in relatively slow request at from 3d. to 4d. per gallon, naked, according to grade. Solvent naphtha meets with a fair amount of inquiry, and values are steadier at about 1s. 2½d. per gallon, naked. Carbolic acid is rather quiet, with crystals offering here at round 7d. per lb., f.o.b., and crude 60's at about 2s. 3½d. per gallon, naked.

Company News

Broken Hill South.—The directors recommend a dividend at the rate of 1s. per share, payable on August 15. Last year a dividend of 1s. 6d. per share was paid.

A. Boake Roberts and Co.—The directors recommend a dividend of 1 per cent., free of income-tax, on the ordinary shares, making 7 per cent. for the year. £5,000 is placed to reserve, making £90,000 and £30,825 is carried forward.

British Oxygen Co.—The directors recommend a dividend of 1s. 3d. per share, payable, less tax, at 4s. 6d. in £ to shareholders registered on June 26, making with the interim dividend of 9d. per share, a total of 2s. or 10 per cent., less tax.

W. and T. Avery.—A preliminary statement shows net profits of £119,482 for the year to March 31 last, against £117,257 last year. A final dividend of 10 per cent. is recommended, making 15 per cent. for the year. £20,000 is again placed to reserve, leaving a balance of £59,035 to be carried forward.

Distillers Company.—A preliminary report states that after placing £500,000 to reserve, as last year, £20,000 to fire insurance fund, against £5,000, and £4,965 to staff funds, the directors recommend a final dividend of 2s. 6d. per share, less tax, equal to 12½ per cent., making 20 per cent. for the year. This is at the same rate as last year, but is payable on an increased capital. The dividend will be paid on August 1. After this payment, and the preference dividend, there remains £269,635 to be carried forward, as against £227,991 brought in.

British Glues and Chemicals, Ltd.—The net profit for the year ended April 30, 1930, after due allowance has been made for depreciation, bad and doubtful debts, and directors' remuneration, amounted to £80,936, to which must be added amount brought forward, £30,976, making £111,912. The directors recommend a payment on July 31 of a dividend at the rate of 5 per cent. per annum on the ordinary shares for the year absorbing £8,750, transfer to taxation reserve account £10,000, transfer to general reserve account £20,000, leaving a balance to be carried forward of £31,162. The directors state that they consider it desirable, in view of condition of trade, to continue policy of building up company's reserves, rather than to recommend larger dividend payments.

New Chemical Trade Marks

Applications for Registration

These lists are specially compiled for us from official sources by Gee and Co., Patent and Trade Mark Agents, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks and Designs.

Opposition to the Registration of the following Trade Marks can be lodged up to July 18, 1930.

Caledon.

Advertised before acceptance, the applicants alleging distinctiveness.

510,630. Class 1. Mineral dyes.

510,631. Class 4. Dyes (not mineral and not for toilet purposes). Scottish Dyes, Ltd., Earl's Road, Grangemouth, Stirlingshire; manufacturers. February 25, 1930. To be Associated with No. 510,630 (2,725) i.

Panto.

512,294. Class 1. Photographic plates and films (sensitised). I.G. Farbenindustrie Aktiengesellschaft (a joint stock company organised under the laws of Germany), Mainzerlandstrasse 28, Frankfort-on-Main, Germany; manufacturers. April 23, 1930.

Altex.

512,941. Class 1. Chemical substances used in manufactures, photography, or philosophical research, and anti-corrosives. British Dyestuffs Corporation, Ltd., Hexagon House, Blackley, Manchester; manufacturers. May 16, 1930.

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sound fire protection if, when that outbreak of fire occurs, prompt extinguishment is to be assured. To have fire extinguishers at hand is not sufficient unless they are of the right type for the risk which they protect. An appliance may be suitable, from every point of view, for installation in an office, but it may be worse than useless in another part of the works.

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Telegrams: Foamite, Wesdo, London.

Commercial Intelligence

Deed of Arrangement

[The following deeds of arrangement with creditors have been filed under the Deeds of Arrangement Act, 1914. Under this Act it is necessary that private arrangements other than those executed in pursuance of the Bankruptcy Act shall be registered within seven clear days after the first execution by the debtor or any creditor. These figures are taken from the affidavit filed with the registered deed, but may be subject to variation on realisation.]

McARTHUR, Thomas, trading as McARTHUR AND CO., 705, Tower Building, Water Street, Liverpool, and residing at Westfield, Bonchurch, I.o.W., dye and tanning extract manufacturer. (D.A., 5/7/30.) Dated June 20, filed June 27. Trustee, J. Harvey, 5, Fenwick Street, Liverpool. Secured creditors, £15,620; liabilities unsecured, £17,995; assets, less secured claims, £16,759.

Mortgages and Charges

*[NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debt due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]*

ENDOCRINES, LTD., London, W., manufacturers of medicinal preparations. (M., 5/7/30.) Registered June 24, £500 debentures, part of £5,000; general charge (except property at Watford, on which they are a second charge). *Nil. March 31, 1929.

Satisfaction

RENTOKIL (SALES), LTD., London, E.C., manufacturers of disinfectants. (M.S., 5/7/30.) Satisfaction registered June 19. £200, registered September 6, 1928.

London Gazette, &c.

Bankruptcy Information

THORNTON, C. J. Hedley, 28, Buckingham Gate, Westminster, London, lately Windsor House, Victoria Street, Westminster, analytical chemist. (R.O., 5/7/30.) Receiving order, June 26. Creditor's petition. First meeting, July 10, 11 a.m., and public examination, August 5, 11 a.m., Bankruptcy Buildings, Carey Street, London, W.C.2.

New Companies Registered

FIELD AND CO. (AROMATICS), LTD., Dominion House, Bartholomew Close, London, E.C.1.—Registered June 27. Nominal capital, £5,000 in £1 shares. Manufacturers of perfumery essences, dyestuffs, perfumes, fruit essences, chemicals and chemical products, etc. Directors: A. Wuertz, C. H. Temple.

CHEMICO, LTD., 70, Pall Mall, London, S.W.—Registered June 28. Nominal capital, £5,000 in 10s. shares. Manufacturers of and dealers in pharmaceutical, medicinal, chemical, surgical rubber, industrial and other preparations and articles, chemical plant and apparatus, cements, oils, lubricants, paints, pigments, and varnishes, perfumes, soaps, dyes, celluloid, etc.

EUROPEAN CYANAMIDE EXPORT CO., LTD., Adelaide House, King William Street, London, E.C.—Registered June 28. Nominal capital, £20,000 in £1 shares. To carry on the business of brokers and commission agents, manufacturers, producers, importers and exporters of and dealers in fertilisers and manures and chemicals and chemical by-products, etc.

R. H. MILLING AND DISTILLATION PLANTS, LTD. Registered July 1. Nominal capital, £500 in 1s. shares (8,000 8 per cent. preference and 2,000 ordinary). To carry on the business of chemists, consulting chemists, scientists, druggists, drysalters, oil and colourmen, dealers in salts, alkalis, acids, drugs and fats, manufacturers of and dealers in plant, machinery, filters, etc. A subscriber: J. G. A. Bickford, 116, Biddulph Mansions, Maida Vale, London, W.9.

WEST INDIES CHEMICAL WORKS, LTD.—Particulars were filed on June 20, 1930, pursuant to Section 344 of the Companies Act, 1929. Nominal capital, £65,000, in 1,000 6 per cent. cumulative first preference, 2,000 10 per cent. cumulative second preference, and 10,000 ordinary shares of £5 each, all of which had been issued and fully paid up to December 31, 1929. The company was incorporated in Jamaica, B.W.I., on June 17, 1907, to enter into such arrangements with the West Indies Chemical Works, Ltd. (incorporated in 1893), as may be necessary for carrying out and complying with a scheme of arrangement sanctioned by the Supreme Court of Jamaica dated June 13, 1907, and to carry on the business of manufacturers of and dealers in all kinds of chemicals, drugs, extracts, tanning materials, etc. The British address is 1, Brazennose Street, Manchester, where Alexander Duncan is authorised to accept service of process and notices on behalf of the company. Directors: Walter Peter, Francis Xavier Knecht, Reginald E. H. Melhado, and Samuel Bateman, all of Jamaica; and Alexander Duncan.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

BRAZIL.—A firm in Pernambuco desires to obtain the representation, on a commission basis or as merchants, in the States of Pernambuco, Alagoas, Parahyba and Rio Grande do Norte, of British manufacturers of white lead, red lead, resin, linseed oil, earthenware, including sanitary ware, zinc sheets, tinplates, tinned wire rods, soda. Reference No. 566.

CANADA.—The City of Toronto Department of Works is calling for tenders, to be presented in Toronto by July 29, 1930, for the supply and installation of two 24 million Imperial gallon centrifugal pumps and two 10 million Imperial gallon centrifugal pumps connected by couplings to electric motors. Ref. A.X. 9,754.

SOUTH AFRICA.—The South African Railways and Harbours Administration is calling for tenders, to be presented in Johannesburg by August 5, 1930, for the supply of machine oil (Tender No. 1707). Ref. B.X. 6,600.

SPAIN.—An agent of good standing in Barcelona wishes to secure the representation of British manufacturers of sulphate of copper, sulphate of iron and anilines. Ref. No. 564.

Tariff Changes

AUSTRALIA.—Several chemical items are included among the amendments to the Australian tariff introduced into the House of Representatives on June 19. The new duty (British Preferential Tariff) on cresylic acid is 1s. per gal. or 25 per cent. *ad val.* (instead of 25 per cent. *ad val.* only under the former rates) carbide of calcium, 2d. per lb. (in place of £6 10s. per ton); tartaric acid, cream of tartar and substitute and phosphate of soda, 5d. per lb. (2d. per lb.); bismuth metal and salts, 8s. per lb. (free or 15 per cent. *ad val.*).

SALVADOR.—The import duty on chlorate of soda is reduced to 18·69 dollars per 100 kilogs.; the duty on charcoal, anthracite, bituminous coal, peat, lignite and coke has been fixed as 1 dollar per 1,000 kilogs.

KENYA, UGANDA AND TANGANYIKA TERRITORY.—The new Customs tariff, which was enforced on April 17 for these three territories, includes the following duties: Essential oils, 30 per cent. *ad val.*; soaps, 5 shillings per 100 lbs. or 20 per cent. *ad val.*; paints, colours, varnishes and driers, 10 per cent. *ad val.* The following are free: Heavy oils in bulk for pavement construction; crude or residual oil not suitable for illumination; oils, tar and creosote; tar and pitch in bulk; acetic and other acids; disinfectants; microscopic stains for laboratory work; fertilisers and manures (artificial or natural); potassium chlorate, cyanide and sulphocyanide, sodium cyanide and sulphocyanide, red phosphorus; radium and radium compounds; silicate of soda, caustic soda and caustic potash, litharge, saltpetre and roll sulphur, in bulk; sulphate of copper, arsenate and arsenite of soda, arsenate of lead, cyanogas, naphthalene, animal dips, insect sprays and similar substances for the prevention or destruction of pests.